# NAVAL POSTGRADUATE SCHOOL

**MONTEREY, CALIFORNIA**

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## MBA PROFESSIONAL REPORT

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**Analysis of Contractor Logistics Support for the P-8 Poseidon Aircraft**

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**Scott Hedrick, and**
**Michael Martin**

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This study assesses the costs as an independent variable (CAIV) of the maintenance manpower of both the original equipment manufacturer (OEM) contractor logistics support (CLS) and an estimated organic Navy compliment for the P-8 Poseidon program. Comparisons to similar aircraft procurements will be analyzed for possible benefits and limitations regarding a single source provider of CLS. Furthermore, current logistic acquisition culture and operational impacts will be reviewed in order to determine feasibility and possible further research.


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# AN ANALYSIS OF CONTRACTOR LOGISTICS SUPPORT FOR THE P-8 POSEIDON AIRCRAFT

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# AN ANALYSIS OF CONTRACTOR LOGISTICS SUPPORT FOR THE P-8 POSEIDON AIRCRAFT

## ABSTRACT

This study assesses the costs as an independent variable (CAIV) of the maintenance manpower of both the original equipment manufacturer (OEM) contractor logistics support (CLS) and an estimated organic Navy compliment for the P-8 Poseidon program. Comparisons to similar aircraft procurements will be analyzed for possible benefits and limitations regarding a single source provider of CLS. Furthermore, current logistic acquisition culture and operational impacts will be reviewed in order to determine feasibility and possible further research.

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# LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| A&P | Airframe and Power Plant |
| ABH1 | Aviation Boatswain's Mate First Class |
| AIMD | Aircraft Intermediate Maintenance Department |
| AIP | Anti-Surface Warfare Improvement Program |
| ALSS | Aviation Life Support Systems |
| AO | Aviation Ordnanceman |
| APN | Aircraft Procurement, Navy |
| ASuW | Anti Surface Warfare |
| ASW | Anti Submarine Warfare |
| BAH | Basic Allowance for Housing |
| BSC | Balanced Scorecard |
| CAIV | Cost as an Independent Variable |
| CAMP | Continued Airworthiness Maintenance Plan |
| CBR | Chemical, Biological and Radiological Warfare |
| CLS | Contractor Logistics Support |
| CMO | Consolidated Maintenance Organization |
| CNO | Chief of Naval Operations |
| D | Depot Level Maintenance |
| DMMH | Direct Maintenance Man-Hour |
| DoD | Department of Defense |
| FAA | Federal Aviation Administration |
| FAC-G | General Facility (Billets) |
| FICA | Federal Insurance Contributions Act |
| FSC | Fleet Support Center |
| FTS | Full Time Support |
| FY | Fiscal Year |
| GAO | Government Accountability Office |
| GSA | General Services Administration |

| | |
|---|---|
| I | Intermediate Level Maintenance |
| IDS | Integrated Defense Systems |
| IPT | Integrated Product Team |
| ISR | Intelligence, Surveillance and Reconnaissance |
| JROTC | Junior Reserves Officer Training Course |
| JSF | Joint Strike Fighter |
| LEGPRO | Legislative Proposal |
| MILCON | Military Construction |
| MMA | Multi-Mission Maritime Aircraft |
| MMCO | Maintenance Material Control Officer |
| MMH/FH | Maintenance Man Hours per Flight Hour |
| MPN | Manpower Personnel Navy |
| MPTE | Manpower, Personnel, Training and Education |
| NAMP | Naval Aviation Maintenance Program |
| NAVAIR | Naval Air Systems Command |
| NCI | NAMP Contractor instructions |
| NJP | Non-Judicial Punishment |
| NPC | Naval Personnel Command |
| O | Organizational Level Maintenance |
| O&S | Operations and Sustainment |
| OEM | Original Equipment Manufacturer |
| OIC | Officer in Charge |
| OSD | Office of the Secretary of Defense |
| PBL | Performance Based Logistics |
| PDS | Primary Deployment Sites |
| PCS | Permanent Change of Station |
| PM | Program Manager |
| PRR | Program Requirements Review |
| QA | Quality Assurance |
| QAR | Quality Assurance Representative |

| | |
|---|---|
| RDT&E | Research Development Test and Evaluation |
| ROTC | Reserves Officer Training Course |
| RPA | Retired Pay Accrual |
| S&I | Special and Incentive |
| SDD | System Design and Demonstration |
| SE | Support Equipment |
| SK | Storekeeper |
| SLA | Single Line of Accounting |
| SLAP | Service Life Assessment Program |
| SOFA | Status of Forces agreement |
| USC | United States Code |
| VA | Department of Veterans Affairs |

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# I. INTRODUCTION

## A. GENERAL

Naval Air Systems Command (NAVAIR) is consistently heading towards performance based logistics and contract logistics support for the sustained lifecycle of its aircraft. The P-8A Poseidon is currently in the acquisition phase with initial delivery scheduled for 2013. The program office is currently studying the benefits and limitations of an Original Equipment Manufacturer Contract Logistics Support (OEM-CLS) model. The intended benefit of the evaluation is to ascertain if OEM-CLS can achieve best value for the P-8A program.

> Performance-Based Logistics (PBL) is a mechanism to integrate the acquisition and sustainment of systems. The primary reason PBL is used as an acquisition strategy is to align purchase and life cycle sustainability based on the projection that 30 percent of program dollars are expended during acquisition, but the remaining 70 percent are for sustainment. (Berkowitz, Gupta, Simpson, & McWilliams, December 2004-March 2005, pp. 254-255).

The basic concept for implementation of OEM-CLS is a "tip-to-tail" contract that covers all aspects of supply chain logistics and maintenance support for the life of the aircraft. Boeing is the OEM and, under this type of contract, would be designated as lead for all aspects of the CLS, managing 100 percent of subcontract work that applies.

Operational requirements specify that there are six primary deployment sites with the capability of two simultaneous aircraft detachments. The following assumptions are made in order to sustain this requirement:

1. The P-8A is based on same mission requirements as the P-3C Anti-Surface Warfare Improvement Program (AIP) aircraft.
2. A 60 hour work week operating 24 hours a day and 7 days a week
3. 35 and 85 hour per month utilization rates depending on site and operations
4. Maintenance man hours per flight hour (MMH/FH) of 9.67
5. Support costs for personnel include the Maintenance Department only (less any SK's or AO's)

## B. BACKGROUND

On June 14, 2004, Boeing won a fierce competition with Lockheed Martin to produce the next generation of maritime patrol aircraft. Designated the P-8 Poseidon, the Multi Mission Maritime Aircraft's (MMA) initial operating capability is expected to be delivered in 2013. With the initial contract of 108 airframes for the Navy alone, the project's value is expected to be worth at least 15 billion dollars up to as much as 45 billion dollars, depending on foreign sales ("P-8 Poseidon," 2007). Boeing and the Navy are on an unforgiving schedule to deliver the new capability to the fleet as the aging P-3 Orion's operational service life is quickly drawing near. Captain Mike Moran, leader of the P-8A MMA Department in NAVAIR's Maritime Surveillance Aircraft Program Office believes, "Naval aviation needs this platform…we are definitely on track to deliver this full-spectrum anti-submarine warfare capability on time and on budget" ("P-8 Poseidon," 2007).


**Figure 1. Mighty P-3C Orion over Stone Mountain, Georgia (from "P-3," 2007)**

In April 1958, the United States Navy announced that a derivative of the Lockheed Electra would serve as the next generation of maritime patrol aircraft to fight the Cold War. The first mighty P-3 Orion entered service in 1962 and has been a mainstay of the fleet since (“P-3,” 2007). The primary mission of this land based aircraft is to provide long range anti-submarine warfare (ASW). Over the years, it has developed into an effective platform to carry out other missions including anti-surface warfare (ASuW), command and control (C2), and intelligence, surveillance and reconnaissance (ISR). The versatility and long range of the platform allows for either solitary over the horizon patrol or integrated battle group operations. The P-3 Orion carries a full arsenal of weapons from the Harpoon and Maverick anti-surface missiles to an assortment of torpedoes, mines and bombs. The Orion has expanded its roles over the years from a strictly maritime aircraft to an over land asset, serving in Kosovo, Afghanistan and Iraq (“P-3,” 2007).

While the P-3 Orion has served the fleet well, its operational service life is quickly drawing to an end. The Navy was able to extend the P-3's service life limit from 7,500 flight hours to 20,000, since predicted stress assessments were not as severe as had been originally assumed. The original limit was based on conservative assumptions about in-flight stresses such as maneuvers and payloads, while the higher limit reflected actual operating experience and more modern analysis of the original fatigue test data (“P-3 Orion,” 1999).

Simultaneously, however, the P-3 inventory was experiencing significant airframe corrosion and was to begin reaching the end of its fatigue life in 2002 (“P-3,” 2007). The Navy, therefore, implemented several programs to increase the service life of the P-3 to 2015 in order to fill the gap until the replacement P-8 becomes operational. In March 1999, Lockheed Martin was awarded a 30 million dollar cost-plus-incentive-fee contract to conduct a service life assessment program (SLAP) for the P-3C aircraft. The primary purpose of the SLAP was to assess the fatigue life and damage tolerance characteristics of the P-3C airframe, and to identify the structural modifications required in an effort to attain the 2015 service life goal (“P-3 Orion,” 1999). Every P-3 in the fleet will need to undergo depot level fatigue inspection and corrosion maintenance in order to fill national maritime patrol requirements until delivery of the P-8. Even with increased sustainment maintenance, the number of Orions in the Navy's inventory begins to decay as the Poseidon comes on station. There is little room for schedule slippage in order to maintain maritime patrol capability.

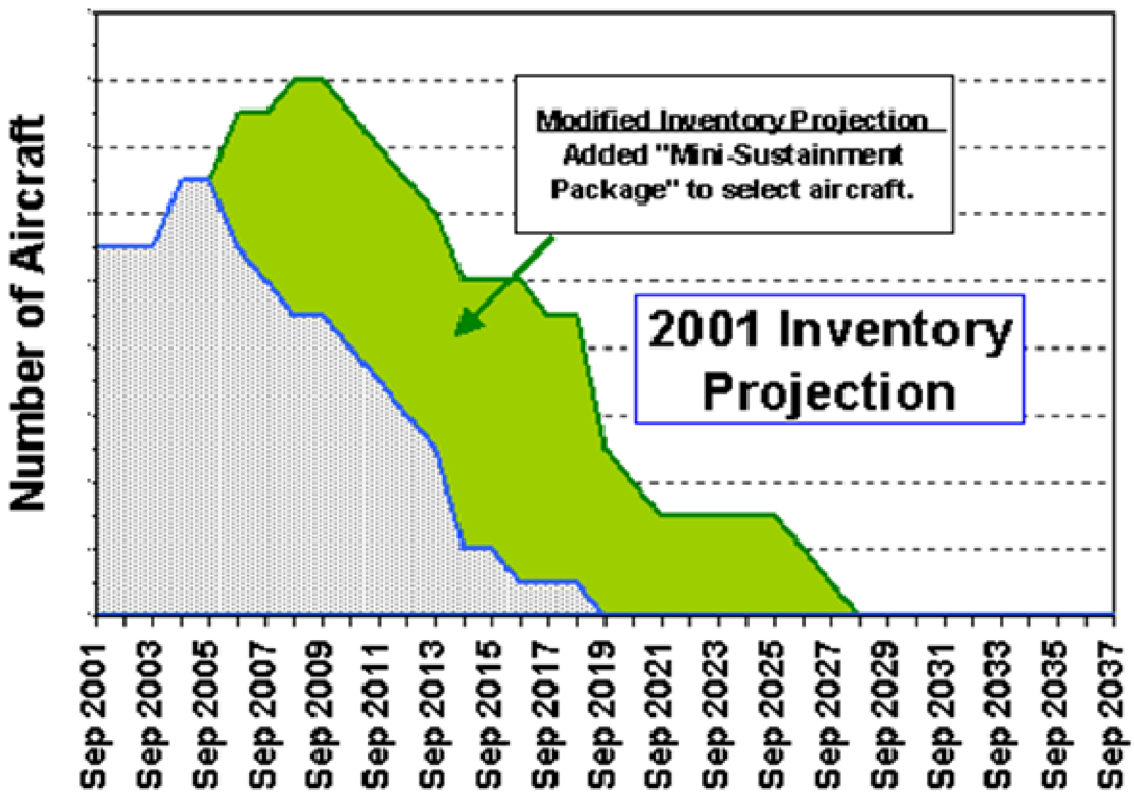


**Figure 2. P-3 Inventory Projections Showing Fatigue Effects and Attrition (from "Health of Naval Aviation," 2007)**

### 1. P-8A Capabilities

The P-8A Poseidon is a modified Boeing 737-800ERX. Its combination of a reliable off-the-shelf airframe, dependable high-bypass turbo fan jet engines and established logistical support around the world was a dominant consideration in awarding the MMA contract to Boeing. The complex sensor suites internal to the airframe allow for employment in anti-submarine, anti-surface, command and control, or surveillance and reconnaissance missions. Specifically, sensor suites will include active multi-static and passive acoustic systems, inverse synthetic aperture radar, an electronic support measures system, an electro-optical and infrared camera system, and a magnetic anomaly detector (MMA, 2007).

A key feature to the internal workings of the platform will be the networking of information between the crew of nine. Crew coordination during any of the complex and versatile missions is achieved by universal multi-function workstations coupled to a local area network. Also, the open mission system architecture allows for reconfigurable and expandable systems and future upgrades. Finally, the ability to transfer information on and off the platform is achieved through the latest in communications suites, including Link-16, internet protocol, common data link and FORCEnet (MMA, 2007).

The lethality of the P-8 Poseidon is its most important capability. The reconfigured 737 will include an internal weapons bay, four wing pylons and two centerline hard points. The digital stores management system allows for the carriage of joint anti-surface missiles, torpedoes and mines. Three internal rotary reloadable sonobouy launchers will be able to carry both active and passive search stores for submarine detection (MMA, 2007).

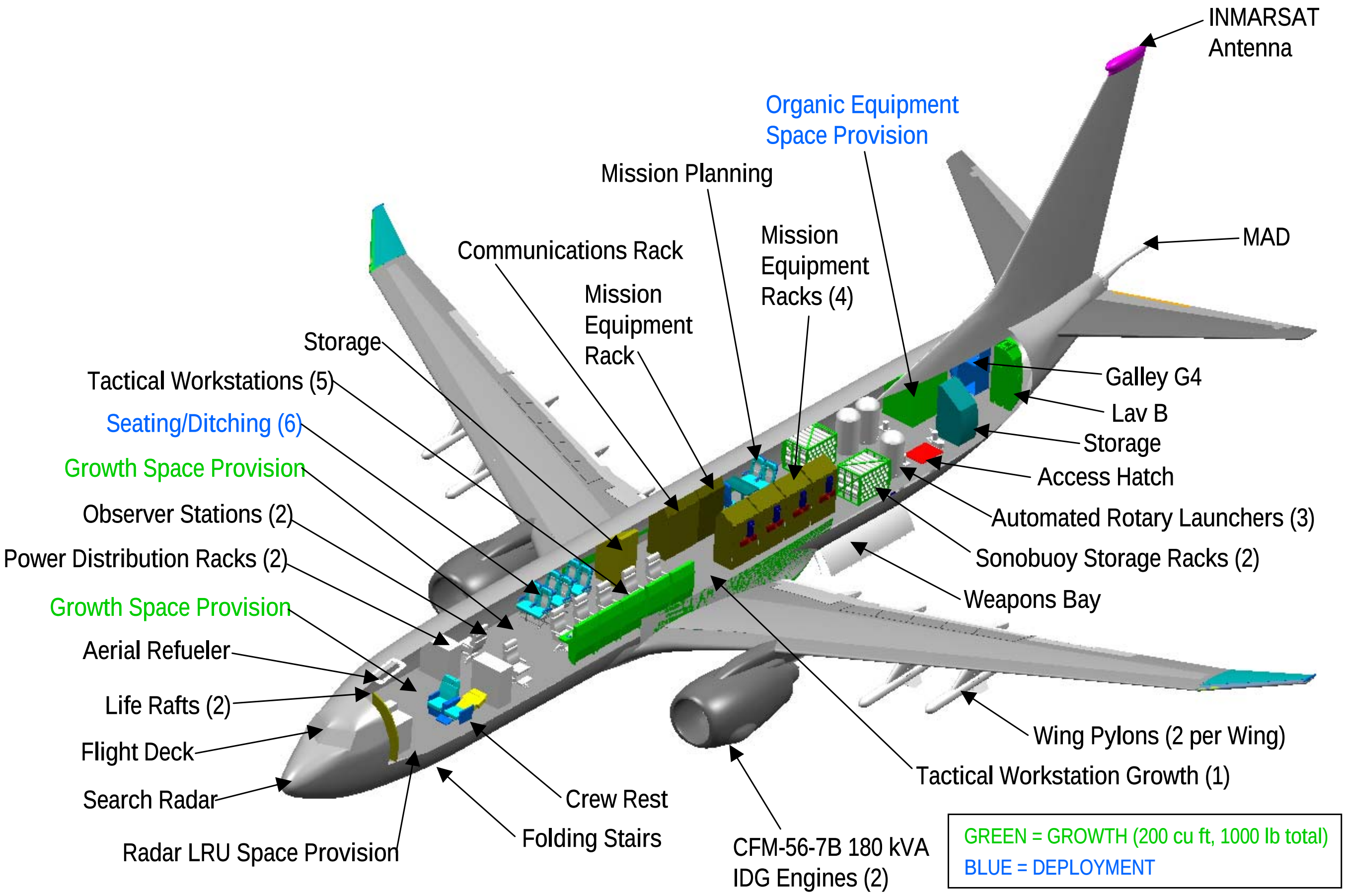


**Figure 3. P-8 Poseidon Planned Layout**
**(from MMA, 2007)**

The NAVAIR website lists these specifications of the P-8 Poseidon (2007):

**General Characteristics:**

**Propulsion:** Two high-bypass turbofan engines (CFM-56-7B) and advanced digital aircraft design.
**Length:** 129.5 feet
**Wingspan:** 124.5 feet
**Height:** 42.1 feet
**Weight:** Maximum Take Off Gross Weight: 188,200 pounds
**Speed:** 490 knots (564 mph)
**Range:** 1,200+ nautical miles with four hours on station (1,381 miles)
**Ceiling:** 41,000 ft
**Crew:** Nine

### 2. P-8A Schedule

The MMA milestone zero was approved in March 2000 and allowed for concept designs. The Acquisition Strategy was approved in February 2002, and Boeing was awarded the contract in February 2004. The program is currently in the System Design and Demonstration (SDD) phase with the critical design review and design readiness reviews scheduled for later this year. Boeing is contracted to produce seven prototype aircraft during the SDD phase (USD (Comptroller), 2007).

Also this year, ground testing will begin and is planned to continue through 2010. Integrated developmental and operational flight testing is scheduled to begin in 2009 (USD (Comptroller), 2007).

Initial low-rate production is scheduled to begin third quarter 2009. The Navy expects to buy 34 low-rate initial production aircraft before transitioning to full-rate production in 2013. 108 aircraft are expected to fill the Navy’s inventory, and Boeing expects to support the entire 25 year cycle life of the platform (“P-8,” 2007).

The P-8 has met every milestone thus far and is still forecasted to be delivered on schedule. As discussed previously, however, any delays would mean a gap in maritime patrol capability as the current fleet of P-3C Orion’s will begin to be stricken from the inventory in 2015.

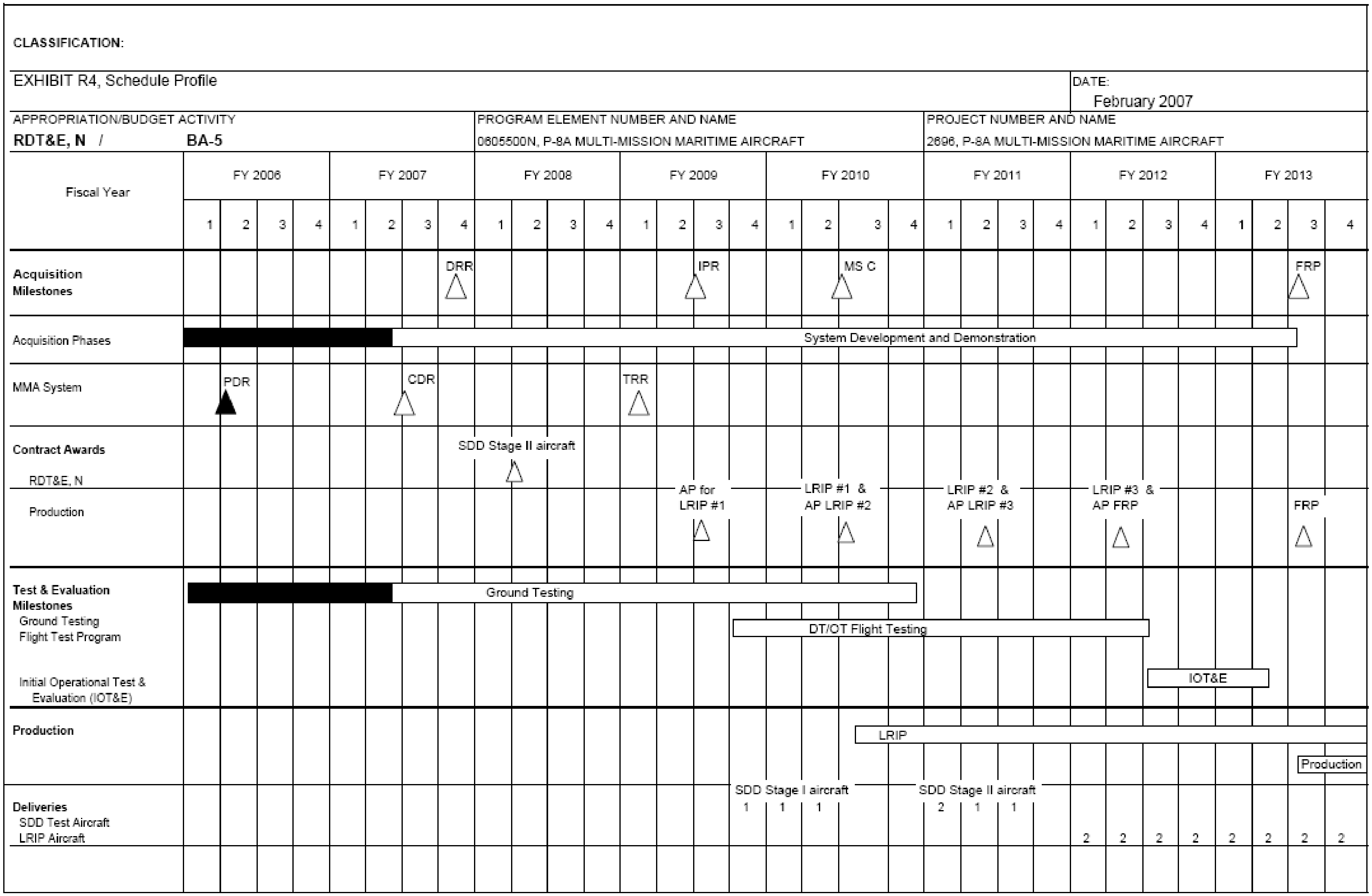


**Figure 4. Acquisition Schedule and Planned Milestones (from USD (Comptroller), 2007)**

### 3. P-8A Estimated Costs

MMA is the second largest aviation research, development test and evaluation funded program behind only the Joint Strike Fighter (MMA, 2007). In 2004, Boeing was awarded a 3.9 billion dollar cost plus award fee contract to develop the weapon system. Procurement is estimated to be 20 billion dollars, and total life cycle costs for 25 years are estimated to be 44 billion dollars ("P-8," 2007).

The Navy is planning on purchasing 108 aircraft with an average fly away cost of 159.9 million dollars and total program average cost of 227.7 million dollars. Currently, the Navy and Boeing are meeting or exceeding all cost objectives (MMA, 2007).

The budget also includes 100 million dollars for military construction. The P-8 is significantly larger than the P-3, and hangars will have to be modified to accommodate ("P-8," 2007).

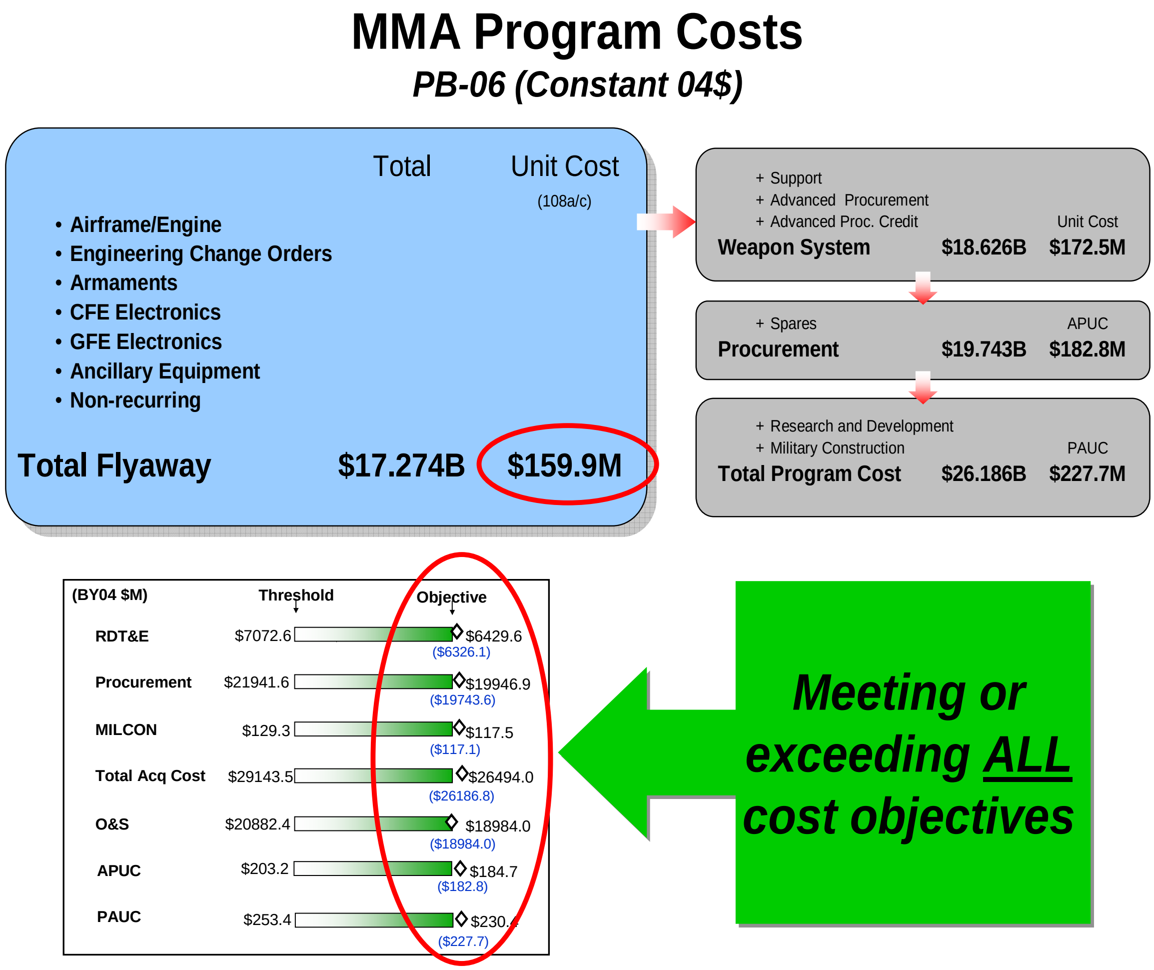


**Figure 5. MMA Program Costs (from MMA, 2007c)**

| Exhibit R-3 Cost Analysis (page 1) | | | | | | | | | | DATE: February 2007 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-5 | | PROGRAM ELEMENT 0605500N, P-8A MULTI-MISSION MARITIME AIRCRAFT | | | | PROJECT NUMBER AND NAME 2696, P-8A MULTI-MISSION MARITIME AIRCRAFT | | | | | | |
| Cost Categories | Contract Method & Type | Performing Activity & Location | Total PY s Cost | FY 2007 Cost | FY 2007 Award Date | FY 2008 Cost | FY 2008 Award Date | FY 2009 Cost | FY 2009 Award Date | Cost to Complete | Total Cost | Target Value of Contract |
| PRODUCT DEVELOPMENT | | | | | | | | | | | | |
| Award Fee for Primary HW | C-CPAF | THE BOEING COMPANY, SEATTLE, WA | 66.777 | 58.214 | 10/1/2006 | 23.267 | 10/1/2007 | 88.886 | 10/1/2008 | 125.452 | 362.596 | 362.596 |
| Info. Assurance | WX | NAWCAD, PATUXENT RIVER MD | .282 | .350 | 11/1/2006 | .350 | 11/1/2007 | .350 | 11/1/2008 | 1.004 | 2.336 | |
| Primary HW Dev - Boeing | C-CPAF | THE BOEING COMPANY, SEATTLE, WA | 1,221.026 | 1,021.900 | 10/1/2006 | 789.755 | 10/1/2007 | 942.451 | 10/1/2008 | 1,690.123 | 5,665.255 | 5,665.255 |
| Primary HW Dev - SPAWAR | WX/RX | SPAWARSYSCOM, SAN DIEGO CA | 5.693 | 5.616 | 2/1/2007 | 6.107 | 2/1/2008 | 6.749 | 2/1/2009 | 9.300 | 33.465 | |
| Sys Eng (Gov) | WX | NAWCAD, PATUXENT RIVER MD; NSWC | 76.300 | 10.399 | 11/1/2006 | 8.072 | 11/1/2007 | 11.585 | 11/1/2008 | 41.375 | 147.731 | |
| All other PY Product Developme | VARIOUS | VARIOUS | 70.538 | | | | | | | | 70.538 | |
| SUBTOTAL PRODUCT DEVELOPMENT | | | 1,440.616 | 1,096.479 | | 827.551 | | 1,050.021 | | 1,867.254 | 6,281.921 | |

Remarks: The total award fee issued was 4.2% of the total PY budget. The award fee reflects total fee, including both the base and award fee.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUPPORT | | | | | | | | | | | | |
| Int. Log Gov | WX | NAWCAD, PATUXENT RIVER MD | 13.170 | 5.600 | 11/1/2006 | 5.814 | 11/1/2007 | 6.036 | 11/1/2008 | 19.529 | 50.149 | |
| SAE (NON-FFRDC) | C-FFP | SPAWARSYSCOM, SAN DIEGO CA & NSMA | 9.440 | .572 | 1/30/2007 | .594 | 1/30/2008 | .616 | 1/30/2009 | 1.994 | 13.216 | 13.216 |
| Tech Dev Gov | WX | NAWCAD, PATUXENT RIVER MD | 44.007 | 6.465 | 11/1/2006 | 4.892 | 11/1/2007 | 6.232 | 11/1/2008 | 23.160 | 84.756 | |
| All other PY Support Cost | VARIOUS | VARIOUS | 4.868 | | | | | | | | 4.868 | |
| SUBTOTAL SUPPORT | | | 71.485 | 12.637 | | 11.300 | | 12.884 | | 44.683 | 152.989 | |

Remarks:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TEST & EVALUATION | | | | | | | | | | | | |
| Dev T&E - Gov | WX | NAWCAD PAX, JITC Ft. Huachuca AZ | 6.487 | 4.567 | 11/1/2006 | 3.156 | 11/1/2007 | 10.348 | 11/1/2008 | 38.699 | 63.257 | |
| GFE & GFI | VARIOUS | NUSC, NAWCAD PAX, NAVSEA, SPAWAR | 1.795 | | | 19.000 | 11/1/2007 | 7.741 | 11/1/2008 | 110.019 | 138.555 | |
| LFT&E - Gov | WX | NAWCWD CLK, NAWCAD PAX, NSWC | 7.653 | 2.767 | 11/1/2006 | 1.967 | 11/1/2007 | 5.449 | 11/1/2008 | 4.506 | 22.342 | |
| Oper Test & Eval - TBD | WX | NAWCAD PAX | | | | | | | | 16.484 | 16.484 | |
| All other PY Test & Evaluation | VARIOUS | VARIOUS | 5.187 | | | | | | | | 5.187 | |
| SUBTOTAL TEST & EVALUATION | | | 21.122 | 7.334 | | 24.123 | | 23.538 | | 169.708 | 245.825 | |

Remarks:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MANAGEMENT | | | | | | | | | | | | |
| Mgnt Suppt Serv (NON-FFRDC) | C-FFP | RBC, INCORPORATED, ALEXANDRIA, VA | 3.101 | 2.316 | 12/30/2006 | 3.982 | 12/30/2007 | 4.507 | 12/30/2008 | 15.819 | 29.725 | 29.725 |
| Program Mgmt Support | WX | NAWCAD, PATUXENT RIVER MD | 9.884 | 8.315 | 11/1/2006 | 5.108 | 11/1/2007 | 3.053 | 11/1/2008 | 17.423 | 43.783 | |
| Travel - EOB | TO | NAWCAD, PATUXENT RIVER MD | 1.315 | .295 | 11/30/2006 | .304 | 11/30/2007 | .415 | 11/30/2008 | 1.826 | 4.155 | |
| All other PY Management Cost | VARIOUS | VARIOUS | 19.060 | | | | | | | | 19.060 | |
| SUBTOTAL MANAGEMENT | | | 33.360 | 10.926 | | 9.394 | | 7.975 | | 35.068 | 96.723 | |

Remarks:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Cost | | | 1,566.583 | 1,127.376 | | 872.368 | | 1,094.418 | | 2,116.713 | 6,777.458 | |

**Figure 6. P-8 Poseidon Projected Costs for FY 2008 and FY 2009 (from USD (Comptroller), 2007)**

| EXHIBIT R-2a, RDT&E Project Justification | | | | | | | | | DATE: February 2007 |
|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-5 | PROGRAM ELEMENT NUMBER AND NAME 0605500N, P-8A MULTI-MISSION MARITIME AIRCRAFT | | | | PROJECT NUMBER AND NAME 3181, P-8A SPIRAL ONE DEVELOPMENT | | | | |
| COST ($ in Millions) | | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | FY 2012 | FY 2013 |
| 3181 P-8A SPIRAL ONE DEVELOPMENT | | | | 7.738 | 15.122 | 30.434 | 35.255 | 36.644 | 24.079 |
| RDT&E Articles Qty | | | | | | | | | |

**Figure 7. P-8 Poseidon Projected RDT&E Costs (from USD (Comptroller), 2007)**

The United States Navy was on the verge of losing a major warfighting capability with the P-3 Orion coming to the end of its service life. Thus, procurement time became a major factor in awarding the next generation of maritime patrol aircraft production to Boeing. The 737 is a proven stalwart in the airline industry and therefore removed much of the risk in airframe and engine design. It is not surprising that the MMA program is on budget and on schedule in the SDD phase of acquisition.

The real program risk is just beginning as the integration of multiple complex sensor suites is attempted. Integration software and user interface will be the true test of the program's management. The Navy was savvy enough to insist on an open architecture for independent plug-and-play systems. This will not only facilitate the initial generation of P-8s, but will also be essential to inevitable future upgrades.

Another major factor in awarding Boeing the MMA contract was logistical support. 737s are flown worldwide with an established system of maintenance support and materiel. The Navy will tap into this infrastructure and redefine its own historic maintenance procedures in an attempt to reduce life cycle costs of this new weapon system.

As the Navy cuts personnel to make budget appropriations, there is an increasing urgency and need for contract maintenance to reduce the life long costs of sustaining military veterans' pay and benefits after a 20-year retirement. This thesis will look at the differences in maintaining this lifetime commitment as compared to the benefits of contracting civilian personnel in part or in whole for the sustainment of the P-8.

This thesis will include a look at contracts and the problems associated with Logistic support and Contract support, a look at the comparisons of CLS and its parallel towards the Naval Aviation Maintenance Program, Boeing Consolidated Aviation maintenance plan and problems and benefits with the use of CLS. This study will also make references to the use of Best Commercial practices by CLS agencies and how the DoD expects to utilize and benefit from their use.

## C. PURPOSE

The purpose of this thesis is to conduct an analysis of the benefits and limitations of PBL as it is applied to an OEM-CLS. This evaluation will be used to study long term maintenance, surge capacity of the contractor, cost as an independent variable (CAIV), operational limitations, and the impacts of the current cultural climate of the P3 community.

The long term maintenance strategy must be evaluated to understand what impact OEM-CLS will have on sustainability of the P-8A aircraft. Consideration must be given to how effective Boeing can be with an overarching contract, covering multiple sub-contractors.

Due to the current state of military affairs, surge capacity will be evaluated based upon current requirements of the P-3C Orion. The program office will establish six Primary Deployment Sites (PDS) with the surge capability of two aircraft detachments in order to conduct its business case analysis. A concrete evaluation of actual requirements will be made to ascertain if this assumption is correct and if the business case analysis has fidelity in regards to real requirements.

The stated objective of the program office is to obtain best value for the life cycle of the P-8A. Although cost is not the determining factor, this research will evaluate cost and will treat cost as an independent variable. Understanding the culture of an organization is critical when fielding change. This project will evaluate the potential impact an OEM-CLS will have on the climate of the P-8A community from an operational and maintenance perspective.

# II. REVIEW OF LITERATURE

## A. GAO REPORT: GAO-05-798

This GAO Report titled "Military Personnel: DoD Needs to Improve the Transparency and Reassess the Reasonableness, Appropriateness, Affordability, and Sustainability of Its Military Compensation System" was generated as a result of the increasing need to understand the total costs of employing military members and to analyze trends in this total compensation. This report recognized that over 60 different pays and allowances make up the total compensation package and included costs from the departments of Veterans Affairs, Education, Labor, and Defense as part of the analysis.

## B. MEMORANDUM FOR DISTRIBUTION

(PR-09 Manpower Rates and Special and Incentive (S&I) Pay Guidance (Serial 5)) (Financial Manager and Chief Resources Officer, Office of the Deputy Chief of Naval Operations for Manpower, Personnel, Training A Education (MPTE))

This document provides guidance for PR-09 Military and Civilian Programming Rates and Special and Incentive (S&I) Pay Program Review representing a shift in the way in which military and civilian manpower is viewed as a part of the resource allocation process. Through the Intelligent Workbook, Navy has captured the military and civilian work requirement to deliver the required warfighting capability to the Operating Forces in a single analytical structure. This is intended to facilitate resource allocation decisions from a work requirement perspective.

## C. ANTI-DEFICIENCY ACT

The *Anti-Deficiency Act* is one of the major laws through which Congress exercises its constitutional control of the public purse. It evolved over a period of time in response to various abuses. In its current form, the law prohibits:

> Making or authorizing an expenditure from, or creating or authorizing an obligation under, any appropriation or fund in excess of the amount available in the appropriation or fund unless authorized by law. 31 USC § 1341(a)(1)(A).
>
> Involving the government in any obligation to pay money before funds have been appropriated for that purpose, unless otherwise allowed by law. 31 USC § 1341(a)(1)(B).
>
> Accepting voluntary services for the United States, or employing personal services not authorized by law, except in cases of emergency involving the safety of human life or the protection of property. 31 USC § 1342.
>
> Making obligations or expenditures in excess of an apportionment or reapportionment, or in excess of the amount permitted by agency regulations. 31 USC § 1517(a)
>
> The fiscal principles underlying the *Anti-Deficiency Act* are really quite simple. Government officials may not make payments or commit the United States to make payments at some future time for goods or services unless there is enough money in the "bank" to cover the cost in full. The "bank," of course, is the available appropriation. 31 USC § 1517(a)

## D. PERFORMANCE MEASURES AND METRICS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT: A REVIEW OF RECENT LITERATURE

As the military goes from traditional supply and logistic channels to more and more outsourcing and contracting, they are met with more challenges, specifically how to measure performance. Finding a suitable metric with which to make decisions can be a problem. Using traditional measures for performance and metrics may not be the right choices for a new enterprise environment. Measuring them is so critical for the successful operation of companies in this environment (Gunasekaran & Kobu, 2007, p. 1). Here the researchers will look at the key performance measures, metrics and supply chain.

How are performance and metrics measured? The authors measured quantifiable subjects to find efficiencies and to ascertain the effectiveness of some type of action or actions. A performance measurement system should provide managers with sufficient information to address issues such as finance, customer internal processes, innovation and improvement (p. 4). Incorporation of these processes into a businesses day to day operation is difficult. There are always problems with how to quantify certain tasks and operations. This can be as simple as imputing data into a computer program and as difficult as figuring out man hours to repair important equipment, along with the entire logistics footprint to achieve that repair.

If one were to ask a group of employees, or managers, what to measure, there would be as many answers as there were individuals questioned. It is necessary to have some measurements to make improvements. If there is nothing to compare the processes to, then there can be no improvements. Or, at the very least, how can one know if an improvement has been made? In a report from 2001, Basu (2007) as cited in (Gunasekaran & Kobu, 2007, p. 6) suggested the use of five new emerging metrics defined in five categories: external, consumer, value-based competition, network performance, and intellectual capital (Gunasekaran & Kobu, 2007, p. 6). Claims that some companies that have out-performed their competition, have been found to be superior in four key areas: 1) delivery performance; 2) flexibility and responsiveness; 3) logistics costs; and 4) asset management.

Perhaps the best known Performance Measure framework is Kaplan and Norton’s “Balanced Scorecard (BSC)” built around five perspectives: financial, customers, internal processes, innovation and improvement. This method has been used extensively in the development of a more realistic strategic plan of goals and initiatives for achieving targets (as cited in Gunasekaran & Kobu, 2007, pp. 6-7).

Figure 8 compares some of the most well known Performance Measurement categories. Included are references to the factions that studied them and their measurement categories.

| Key references | Criteria | Details |
|---|---|---|
| Kaplan and Norton (1997) | Balanced score card perspective | • Financial<br>• Internal process<br>• Innovation and improvement<br>• Customers |
| Beamon (1999) | Components of performance measures | • Time<br>• Resource Utilization<br>• Output<br>• Flexibility |
| Gunasekaran *et al*. (2001) | Location of measures in supply chain links | • Planning and Product Design<br>• Supplier<br>• Production<br>• Delivery<br>• Customer |
| Gunasekaran *et al*. (2001) | Decision-making levels | • Strategic<br>• Tactical<br>• Operational |
| Financial base (De Toni and Tonchia 2001) | Nature of measures | • Financial<br>• Non-financial |
| Gunasekaran *et al*. (2001) | Measurement base | • Quantitative<br>• Non-quantitative |
| Bagchi (1996) | Traditional vs. modern measures | • Function-based<br>• Value-based |

**Figure 8. Categories of Performance Measurement in Logistics and Supply Chain Systems (from Gunasekaran & Kobu, 2007, p. 6)**

# III. METHODOLOGY

## A. INTRODUCTION

This chapter is a summary of the methodology that will be used in describing the benefits and limitations of an OEM-CLS maintenance structure for the P-8A program. Additionally it will analyze cost as an independent variable (CAIV) with regards to the OEM-CLS model, a completely organic Consolidated Maintenance Organization (CMO) model, and an organic/CLS blended model. Further research is conducted into the best maintenance and operational requirements for the P-8.

### 1. Research Objectives

This research analyzes the benefits and limitations of an OEM-CLS maintenance model for the life cycle of the P-8A. One aspect of this research will construct an independent analysis of cost for the organic CMO model, the organic/CLS blended model, and make a comparison of this analysis to NAVAIR 4.2's cost estimate. The independent analysis developed by this research will then create a three pronged comparison of costs represented by the independent analysis, NAVAIR 4.2's estimate, and then will be applied to Boeing's cost submission of an OEM-CLS maintenance construct. Once complete, the cost structure will be evaluated for how well these cost savings can be translated into funding for OEM-CLS.

Secondly, the same maintenance constructs will be analyzed from operational and maintenance perspectives. While cost is an easily comparable metric, it is only a single factor when comparing the multiple options before the program office. The intangible benefits and limitations of each option are to be weighed independently in this research.

### 2. Measurement Questions

- What is the cost of an OEM-CLS maintenance construct for the life cycle of the P-8A?
- What is the cost of a completely organic CMO maintenance model for the life cycle of the P-8A?

- What is the cost of an organic/CLS blended maintenance option for the life cycle of the P-8A?
- What legal limitations apply to the cost of each maintenance option?
- Can potential savings be recaptured for reprogramming to pay the OEM-CLS bill?
- What is the impact of CLS for maintenance and the impact on normal Navy maintenance procedures?
- What are the operational impacts of a complete organic CMO maintenance model, a complete CLS model or a hybrid model?

## B. ANALYSIS TOOLS

### 1. Cost as an Independent Variable (CAIV)

Cost analysis tools will include:

- Boeing's cost for OEM/CLS (validated by NAVAIR 4.2)
- NAVAIR 4.2's Organic CMO Costing Model
- NAVAIR 4.2's Organic/CLS Blended Option Costing Model
- MPTE/GAO Organic CMO Costing Model (developed for this research)
- MPTE/GAO Organic/CLS Blended Option Costing Model
- Enlisted Shore Rotation Costing Model (developed for this research)
- Analysis of real Navy savings based on enlisted manpower reduction

The independent cost analysis conducted by this research will come from (1) publications from the Government Accountability Office (GAO), (2) instructions and interviews from the Office of the Deputy Chief of Naval Operations for Manpower, Personnel, Training and Education (MPTE), (3) interviews with the Deputy Head Enlisted Community Manager at the Naval Personnel Command (NPC) (4) publications, presentations, and interviews from the P-8A Product Support Team, and (5) manpower documents and interviews from the FAC-G Billet Coordinator, Naval Personnel Command (NPC).

### 2. Analyzing Studies and Overviews Already Made

- NAMP - Naval Aviation Maintenance Program, OPNAVINST 4790.2(series)
- CAMP- Continued Airworthiness Maintenance Plan
- P-8A Multi Mission Aircraft NAMP Contractor Instructions (NCIs)
- GAO report on Commercial Best Practices
- GAO report on Contract Management and Oversight
- GAO report on Quality Assurance in contracts
- Site visits and interviews

To date, no weapon system has been deployed operationally with a complete CLS support system. Operational impacts are therefore speculative and subjective. The best methodology to reach the stated objectives is to accumulate as much expert testimony as possible regarding the future of the MMA community and find as much consensus as possible. For the purposes of this study, experts will be defined as personnel within the Patrol and Reconnaissance community who are in command of a squadron or have been in command of a squadron.

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# IV. ANALYSIS AND RESULTS

## A. MAINTENANCE MANPOWER COST ANALYSIS

The cost structure that has been used to quantify the difference between an OEM-CLS structure, an organic model, and an organic/CLS blended option are costs associated only with maintenance manpower requirements. Although various manpower numbers for the proposed options have changed over the course of this research, the analysis will be conducted using the latest OEM-CLS cost estimate provided by NAVAIR, an organic CMO of 885 personnel, and the organic/CLS Blended option as 802 military personnel and 51 CLS personnel. The research will attempt to capture all expenditures related to the compensation packages offered active duty service members in the United States military.

The following paragraphs will outline OEM-CLS, maintenance manpower costs from Boeing, two methods of cost analysis for an organic manpower structure, two methods for an organic/CLS blended option, and one method tailored directly to Navy savings for the P-8A program (Tuemler, 2007, October 12). The first analytical approach was produced by the NAVAIR 4.2, who is the Naval Air Systems Command's point of contact for manpower analysis (Tuemler, 2007, October 12). The second approach is derived using the Office of the Deputy Chief of Naval Operations (Manpower, Personnel, Training and Education) (MPTE) (N1) cost information for fielding specific rates for officer and enlisted personnel for the span of one year and is combined with GAO report GAO-05-798 to build a new comprehensive cost analysis that is inclusive of the rank structure of organic requirements for comparison to CLS personnel (McAvoy, 2007, October 18).

Boeing's estimate does not include the weapons handling division or the supply support divisions. These functions have been designated as government functions only. All analysis will omit these functions for proper comparison.

### 1. OEM-CLS Cost Analysis

Boeing has proposed that full CLS by Boeing will reduce maintenance manpower requirements when compared to the current P-3C organizational (O) level squadron maintenance and that provided by the local Aircraft Intermediate (I) Maintenance Department (AIMD). All O-level aircraft, mission, Aviation Life Support Systems (ALSS), and Support Equipment (SE) maintenance will be accomplished by Boeing (the Navy will retain the responsibility for ordnance, ordnance loading, and I and Depot (D) level ALSS maintenance). Navy AIMDs, as available, will be considered as sources of maintenance and subsequently evaluated, along with other commercial maintenance providers, on capability, performance, and cost. Boeing will use CLS personnel to perform detachment maintenance. In addition to maintenance, CLS will consist of an on-site cadre to manage and maintain spare parts, SE, ALSS, provide engineering and liaison to contractor and Navy support personnel, e.g. – NAVAIR, wings, squadrons, Boeing, our commercial teaming partners, and other original equipment manufacturers and suppliers. Manning not addressed in this document is that required for training and trainer maintenance. Manpower estimates are based on support operations experience from similar aircraft support programs, e.g. E-6, C-40, T-45, and F-18, and flight hours and Direct Maintenance Man-Hour (DMMH) algorithms for flight hour based maintenance (Boeing, 2007).

Boeing provided an initial cost estimate presented in Figure 9 below. After the initial “SJC” submission, NAVAIR 4.2 contacted Boeing with undisclosed questions about their rate structure (Haines, 2007, October 12). This generated a second cost submission labeled as “SCA” in Illustration 1. Boeing quickly retracted the SCA cost estimate (as significant elements in the cost structure were not included) and submitted a third rate proposal of $3.123 billion that is currently being used by the P-8A Integrated Product Team (IPT) as the basis for comparison (Tuemler, 2007, November 26).

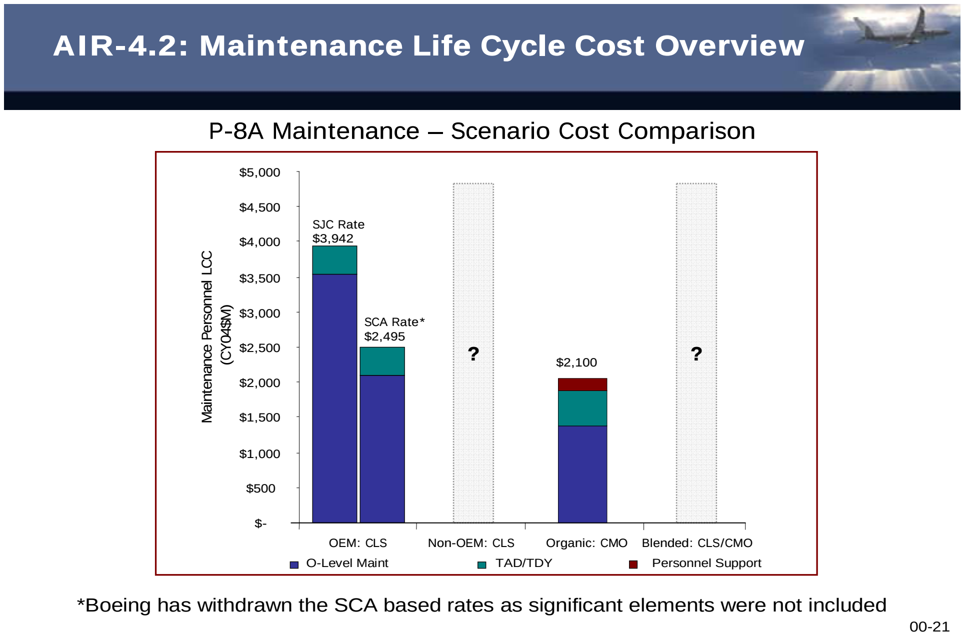



**Figure 9. Maintenance life cycle cost overview (from Tuemler, 2007, October 12,**

## 2. Organic Cost Analysis

NAVAIR 4.2 is tasked with providing the Program Manager (PM) with the costs associated with manpower and with evaluating the validity of a contractor's proposal. No specifics were given on what variables are comprised in the NAVAIR 4.2 numbers and the researchers' attempts at further query were met with, "4.2 is a trusted agent and does not feel it's necessary to provide the details" (Tuemler, 2007, October 12, It was further explained that NAVAIR 4.2 used a flat rate of $94,000 per person (Tuemler, 2007, October 12)._Based on that information, Table 1 was constructed to validate the $2.1 billion dollars assigned to an organic CMO in Figure 9.

**Table 1. NAVAIR 4.2 Organic Manpower Cost Analysis**

| Personnel Required | Average Personnel Cost | Lifecycle Span (years) | Total Cost |
|---|---|---|---|
| 885 | $94,000 | 25 | $2,079,750,000 |

In order to understand the cost relationship between an OEM and organic structure for maintenance of the P-8A aircraft, the total cost of manpower must be evaluated. The GAO states that "No single source exists to show the total cost of military compensation, and tallying the full cost required us to synthesize information from several different portions of the federal budget" (GAO, 2005, p. i). To construct a comprehensive manpower cost evaluation that could specifically compare to Boeing's rates, a new cost analysis has been generated that combines FY09 rates from the Office of the Deputy Chief of Naval Operations (MPTE) and FY04 rates from General Accountability Office report GAO-05-798. This independent evaluation is made at the request of the IPT Lead and initiated the start of the OEM-CLS research with a comparison to NAVAIR 4.2's numbers (Moran, 2007).

In the Office of the Deputy Chief of Naval Operations (MPTE), calculations for manpower are derived by multiple sources and computed in the following manner: Initial Manpower Personnel Navy (MPN) and Full Time Support (FTS) rates for use in developing Program Requirements Review (PRR) authorized billet issues are provided in Table 2 below:

Table 2. MPTE Manpower Programming Rates (from McAvoy, 2007, October 18)

| PR-09 Strength-Only MPN and FTS Programming Rates ($TY) | | | | | |
|---|---|---|---|---|---|
| **Grade** | **FY09** | **FY10** | **FY11** | **FY12** | **FY13** |
| **O-10** | 252,160 | 259,790 | 267,667 | 275,571 | 283,639 |
| **O-9** | 236,948 | 244,290 | 251,876 | 259,490 | 267,267 |
| **O-8** | 218,510 | 225,317 | 232,354 | 239,401 | 246,596 |
| **O-7** | 197,802 | 203,993 | 210,395 | 216,790 | 223,312 |
| **O-6** | 178,573 | 184,259 | 190,143 | 196,028 | 202,029 |
| **O-5** | 150,079 | 154,845 | 159,771 | 164,862 | 170,116 |
| **O-4** | 129,133 | 133,239 | 137,485 | 141,873 | 146,403 |
| **O-3** | 106,585 | 109,975 | 113,482 | 117,106 | 120,848 |
| **O-2** | 87,255 | 90,035 | 92,911 | 95,885 | 98,955 |
| **O-1** | 67,684 | 69,846 | 72,086 | 74,403 | 76,795 |
| **W-5** | 144,773 | 149,363 | 154,107 | 159,010 | 164,070 |
| **W-4** | 130,050 | 134,167 | 138,423 | 142,820 | 147,359 |
| **W-3** | 112,480 | 116,049 | 119,739 | 123,554 | 127,491 |
| **W-2** | 97,855 | 100,973 | 104,200 | 107,536 | 110,979 |
| **Grade** | **FY09** | **FY10** | **FY11** | **FY12** | **FY13** |
| **E9** | 115,928 | 119,601 | 123,401 | 127,327 | 131,381 |
| **E8** | 96,355 | 99,425 | 102,602 | 105,887 | 109,279 |
| **E7** | 85,530 | 88,250 | 91,065 | 93,976 | 96,981 |
| **E6** | 71,837 | 74,130 | 76,504 | 78,960 | 81,496 |
| **E5** | 58,815 | 60,679 | 62,609 | 64,607 | 66,669 |
| **E4** | 46,095 | 47,523 | 49,003 | 50,533 | 52,112 |
| **E3** | 36,383 | 37,494 | 38,646 | 39,837 | 41,064 |
| **E2** | 31,993 | 32,925 | 33,892 | 34,890 | 35,917 |
| **E1** | 24,815 | 25,552 | 26,318 | 27,110 | 27,924 |

Initial granular programming rates for active Navy personnel include a specific portion of manpower costs. These include: base pay, basic allowance for housing (BAH), basic allowance for subsistence, retired pay accrual (RPA), Federal Insurance Contributions Act (FICA), uniform allowances (enlisted personnel only), and unemployment compensation. Base pay, RPA, FICA and uniform allowances are governed by Office of the Secretary of Defense (OSD) promulgated guidance and Navy policy. These initial rates do not include: education benefits, PCS, ROTC/JROTC, special and incentive pay, reimbursables, separation payments and healthcare accrual. Adjustments were made to each grade rate to reflect the influence of the seniority of the force. BAH portions of the rate were distributed using historical execution proportions. In order to properly combine the MPTE numbers with the GAO report figures, a 3 percent per year reduction was used to adjust the FY09 numbers from Table 1 to constant FY04 dollars based on average cost of living adjustments (McAvoy2007, October 30). Figure 10 depicts this breakdown.

**Rates Include:**

- Base Pay
- Basic Allowance for Housing
- Basic Allowance for Subsistence
- Retired Pay Accrual
- FICA
- Uniform Allowance (Enlisted)
- Unemployment Insurance

**Rates Do Not Include:**

- Education Benefits
- PCS
- ROTC/JROTC
- Special & Incentive Pay
- Reimbursables
- Separation Payments
- Healthcare Accrual

| Grade | FY09 | FY04 |
|---|---|---|
| O-5 | 150,079 | 127,567 |
| O-4 | 129,133 | 109,763 |
| O-3 | 106,585 | 90,598 |
| O-2 | 87,255 | 74,167 |
| O-1 | 67,684 | 57,531 |
| W-5 | 144,773 | 123,057 |
| W-4 | 130,050 | 110,543 |
| W-3 | 112,480 | 95,608 |
| W-2 | 97,855 | 83,177 |
| E9 | 115,928 | 98,539 |
| E8 | 96,355 | 81,901 |
| E7 | 85,530 | 72,700 |
| E6 | 71,837 | 61,062 |
| E5 | 58,815 | 49,993 |
| E4 | 46,095 | 39,181 |
| E3 | 36,383 | 30,926 |

**Figure 10. Breakdown between FY09 adjustment to FY04 constant dollars**

Using the rate structure from Illustration 2 and applying these rates to the specific rank of personnel is how the comparison model was developed and is reflected in Table 3 and Table 4, calculating a combined enlisted/officer cost of $1,071,800,250 over the 25-year life cycle of the P-8A. Computing a specific cost associated with rank provides more granularity to the overall cost figure. As cited above, the NAVAIR 4.2 figures only represent a mean average of all Navy personnel, which left by itself could over/under value the estimate based upon different organizational structures.

**Table 3. MPTE Manpower Costs (P-8A Organic CMO) (Officer)**

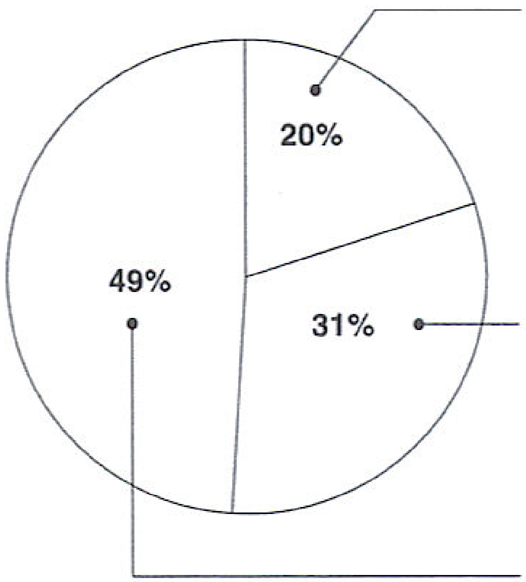
| OFFICER | CDR | LCDR | LT | LTJG | ENS | CWO4 | CWO3 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Maint (MO) | 2 | | | | | | | 2 |
| Maint (AMO) | | 6 | | | | | | 6 |
| Maint (MCO) | | | 6 | 1 | | | | 7 |
| Maint (MMCO) | | | 2 | 3 | | | | 5 |
| Maint (DIV O's) | | | 2 | 4 | 8 | | | 14 |
| Maint (WEPS) | | | | | | 5 | 1 | 6 |
| TOTAL | 2 | 6 | 10 | 8 | 8 | 5 | 1 | 40 |
| COST PER PERSON | $ 127,567 | $ 109,763 | $ 90,597 | $ 74,167 | $ 57,531 | $ 110,543 | $ 95,608 | |
| TOTAL COST | $ 255,134 | $ 658,578 | $ 905,970 | $ 593,336 | $460,248 | $ 552,715 | $ 95,608 | $3,521,589 |

Table 4. MPTE Manpower Costs (P-8A Organic CMO) (Enlisted)

| ENLISTED | E9 | E8 | E7 | E6 | E5 | E4 | E3 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Maint. (020) (CPO) | 6 | 12 | 26 | | | | | 44 |
| Maint. (020) (AZ) | | | | 6 | 8 | 11 | 13 | 38 |
| Maint. (030) | | | | | 6 | | 6 | 12 |
| Maint. (040) | | 6 | | 72 | 6 | 1 | 6 | 91 |
| Maint. (05C/D) | | | | | 1 | 1 | 1 | 3 |
| Maint. (Div. CPO's) | | 15 | 2 | | | | | 17 |
| Maint. (110) | | | 4 | 9 | 18 | 24 | 33 | 88 |
| Maint. (120) | | 2 | 5 | 15 | 28 | 39 | 56 | 145 |
| Maint. (12C) | | | | 6 | | 8 | 7 | 21 |
| Maint. (13A) | | | | 5 | 9 | 13 | 17 | 44 |
| Maint. (13B) | | | | 4 | 6 | 8 | 9 | 27 |
| Maint. (140) | | | | 8 | 4 | | | 12 |
| Maint. (210) | | | 4 | 8 | 16 | 23 | 29 | 80 |
| Maint. (220) | | | 3 | 5 | 13 | 16 | 18 | 55 |
| Maint. (310) | | 2 | 7 | 15 | 28 | 36 | 80 | 168 |
| TOTAL | 6 | 37 | 51 | 153 | 143 | 180 | 275 | 845 |
| COST PER PERSON | $ 98,539 | $ 81,902 | $ 72,701 | $ 61,061 | $ 49,993 | $ 39,181 | $ 30,826 | |
| TOTAL COST | $ 591,234 | $3,030,374 | $3,707,751 | $9,342,333 | $7,148,999 | $7,052,580 | $8,477,150 | $ 39,350,421 |
| | | | | | **TOTAL OFFICERS** | | | **40** |
| | | | | | **TOTAL ENLISTED** | | | **845** |
| | | | | | **SQUADRON TOTAL** | | | **885** |
| TOTAL COST (Officer + Enlisted) | | | | | | | | $ 42,872,010 |

Once the consolidated figure of $1,071,800,250 has been calculated, the remaining non-cash benefits, deferred benefits, and other cash compensation that is derived from GAO Report GAO-05-798 must be applied specifically to Figure 11 below (GAO, 2005, p. 22).

**Total cost to provide compensation was about $112,000 per active duty member—benefits made up about 51 percent of this cost.**




Noncash benefits:

| | |
|---|---|
| Health care | $6,829 |
| Installation-based benefits | 3,700 |
| Subsistence in kind | 2,455 |
| Family housing and barracks | 2,221 |
| Education | 466 |
| Other benefits | 7,093 |
| Total noncash benefits | $22,765 |

Deferred benefits:

| | |
|---|---|
| Retired pay accrual | $9,072 |
| VA compensation and pension | 7,839 |
| VA health care | 7,303 |
| VA other | 771 |
| Health care accrual | 9,643 |
| Total deferred benefits | $34,629 |

Cash compensation:

| | |
|---|---|
| Basic pay | $33,502 |
| Housing allowance | 8,507 |
| Subsistence allowance | 2,380 |
| Special and incentive pays | 3,021 |
| Other allowances | 2,441 |
| Federal tax advantage | 4,538 |
| Total cash compensation | $54,389 |

Source: GAO analysis.

Note: Over 100,000 mobilized reservists were paid out of total cash compensation. Accounting for those reservists, the average cash compensation was about $49,000 per servicemember. These costs reflect the average costs to the government to provide these components of compensation. For example, all servicemembers do not receive a cash housing allowance, because some servicemembers live on base in family housing or barracks. The cost presented represents the total amount appropriated for housing allowances divided by the number of servicemembers, thus, an average cost to the government.

**Figure 11. The allocation of cash, non cash and deferred compensation cost per active duty service member (from GAO, 2005, p. 22)**

After accounting for the MPTE costs and creating a consolidation point, the following figures were derived from Figure 10 and are represented in Table 5.

**Table 5. GAO Compensation Costs (Minus Covered MPTE Costs)**

The following rates were omitted:

- Base Pay
- Basic Allowance for Housing
- Basic Allowance for Subsistence
- Retired Pay Accrual

| NON-CASH BENEFITS | AVG COST |
|---|---|
| Health Care | 6829 |
| Installation-Based Benefits | 3700 |
| Family Housing and Barracks | 2221 |
| Education | 466 |
| Other Benefits | 7093 |
| Total: | 20309 |
| | |
| DEFERRED BENEFITS | |
| VA Compensation & Pension | 7839 |
| VA Health Care | 7303 |
| VA Other | 771 |
| Health Care Accrual | 9643 |
| Total: | 25556 |
| | |
| CASH COMPENSATION | |
| Special and Incentive Pays | 3021 |
| Other Allowances | 2441 |
| Federal Tax Advantage | 4538 |
| Total: | 10000 |
| | |
| Total GAO Compensation (minus MPTE program rates) | 55865 |

The figures from Tables 3, 4, and 5 were combined to provide a comprehensive snapshot of the cost of an organic CMO structure over the lifecycle of the P-8A to benchmark the comparison to Boeing’s OEM-CLS financial proposal and to validate the numbers provided by NAVAIR 4.2. The total figure was \$2.3 billion, representing a cost of \$8.3 million more per year than NAVAIR 2.0’s projection, but is within a reasonable percentage for comparison.

Table 6 computes the combined MPTE and GAO numbers to represent the organic CMO maintenance manpower structure for the lifecycle of the P-8A.

**Table 6. Organic CMO Manpower Costs (GAO + MPTE)**

| OFFICER | O5 | O4 | O3 | O2 | O1 | CW04 | CW03 |
|---|---|---|---|---|---|---|---|
| MPTE (N10) COST | $127,567 | $109,763 | $90,597 | $74,167 | $57,531 | $110,543 | $95,608 |
| GAO COST (FY04) | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| TOTAL | $183,432 | $165,628 | $146,462 | $130,032 | $113,396 | $166,408 | $151,473 |
| TOTAL REQUIRED | 2 | 6 | 10 | 8 | 8 | 5 | 1 |
| TOTAL COST | $366,864 | $993,768 | $1,464,620 | $1,040,256 | $907,168 | $832,040 | $151,473 |
| LIFE CYCLE COST | $9,171,600 | $24,844,200 | $36,615,500 | $26,006,400 | $22,679,200 | $20,801,000 | $3,786,825 |
| **ENLISTED** | **E9** | **E8** | **E7** | **E6** | **E5** | **E4** | **E3** |
| MPTE (N10) COST | $98,539 | $81,902 | $72,701 | $61,061 | $49,993 | $39,181 | $30,826 |
| GAO COST (FY04) | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| TOTAL | $154,404 | $137,767 | $128,566 | $116,926 | $105,858 | $95,046 | $86,691 |
| TOTAL REQUIRED | 6 | 37 | 51 | 153 | 143 | 180 | 275 |
| TOTAL COST | $926,424 | $5,097,379 | $6,556,866 | $17,889,678 | $15,137,694 | $17,108,280 | $23,840,025 |
| LIFE CYCLE COST | $23,160,600 | $127,434,475 | $163,921,650 | $447,241,950 | $378,442,350 | $427,707,000 | $596,000,625 |
| **OVERALL TOTAL** | **$2,307,813,375** | | | | | | |

To summarize the cost per military person, a simple mean analysis can be established to make a comparison between NAVAIR 4.2, the GAO-05-798 Report, and MPTE/GAO averages. Table 7 illustrates this mean comparison.

**Table 7. Average Manpower Cost Comparison (NAVAIR, MPTE/GAO, GAO)**

| RANK | REQUIRED | NAVAIR 2.0 COST | GAO-05-798 COSTS | MPTE/GAO COST |
|---|---|---|---|---|
| O5 | 2 | $ 188,000 | $ 224,000 | $ 366,864 |
| O4 | 6 | $ 564,000 | $ 672,000 | $ 993,768 |
| O3 | 10 | $ 940,000 | $ 1,120,000 | $ 1,464,620 |
| O2 | 8 | $ 752,000 | $ 896,000 | $ 1,040,256 |
| O1 | 8 | $ 752,000 | $ 896,000 | $ 907,168 |
| CW04 | 5 | $ 470,000 | $ 560,000 | $ 832,040 |
| CWO3 | 1 | $ 94,000 | $ 112,000 | $ 151,473 |
| E9 | 6 | $ 564,000 | $ 672,000 | $ 926,424 |
| E8 | 37 | $ 3,478,000 | $ 4,144,000 | $ 5,097,379 |
| E7 | 51 | $ 4,794,000 | $ 5,712,000 | $ 6,556,866 |
| E6 | 153 | $ 14,382,000 | $ 17,136,000 | $ 17,889,678 |
| E5 | 143 | $ 13,442,000 | $ 16,016,000 | $ 15,137,694 |
| E4 | 180 | $ 16,920,000 | $ 20,160,000 | $ 17,108,280 |
| E3 | 275 | $ 25,850,000 | $ 30,800,000 | $ 23,840,025 |
| | | | | |
| TOTAL | 885 | $ 83,190,000 | $ 99,120,000 | $ 92,312,535 |
| AVG COST | | $ 94,000 | $ 112,000 | $ 104,308 |

### 3. CMO Blend (Organic Maintenance Structure with CLS)

A team of subject matter experts met on 19 October 2007 to study the feasibility of an organic/CLS blend (Haines, 2007). This option used the basic organic CMO structure while integrating contractor support personnel within the maintenance manpower model. This new model reduces the amount of officers by 27 and enlisted personnel by 56 for a total reduction of 83 personnel. The CMO blend model adds in 51 contractor support personnel, which represents a difference (-32) in maintenance manpower, and NAVAIR 4.2 has estimated its total costs at $2.161 billion (Tuemler, 2007, November 26). Applying the same model for manpower cost used in the organic CMO structure the military costs based on MPTE, costs are separated by maintenance division and rank in Tables 8 and 9 below:

## Table 8. MPTE Manpower Costs (P-8A Organic/CLS CMO) (Officer)

| OFFICER | CDR | LCDR | LT | LTJG |
|---|---|---|---|---|
| Maint (MO) | 2 | | | |
| Maint (AMO) | | 6 | | |
| Maint (MCO) | | | | |
| Maint (MMCO) | | | 2 | 3 |
| Maint (DIV O's)+A19 | | | | |
| Maint (WEPS) | | | | |
| TOTAL | 2 | 6 | 2 | 3 |
| COST PER PERSON | $ 127,567 | $ 109,763 | $ 90,597 | $ 74,167 |
| TOTAL COST | $ 255,134 | $ 658,578 | $ 181,194 | $ 222,501 |

## Table 9. MPTE Manpower Costs (P-8A Organic/CLS CMO) (Enlisted)

| ENLISTED | E9 | E8 | E7 | E6 | E5 | E4 | E3 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Maint. (020) (CPO) | 6 | 12 | 26 | | | | | 44 |
| Maint. (020) (AZ) | | | | 6 | 8 | 11 | 13 | 38 |
| Maint. (030) | | | | | 6 | | 6 | 12 |
| Maint. (040) | | 6 | | 66 | 6 | | 6 | 84 |
| Maint. (05C/D) | | | | 3 | 3 | 0 | 3 | 9 |
| Maint. (Hazmat) | | | | | | | 3 | 3 |
| Maint. (Div. CPO's) | | 17 | 2 | | | | | 19 |
| Maint. (110) | | | 4 | 9 | 14 | 17 | 22 | 66 |
| Maint. (120) | | 2 | 5 | 15 | 25 | 32 | 44 | 123 |
| Maint. (12C) | | | | 6 | | 8 | 7 | 21 |
| Maint. (13A) | | | | 5 | 9 | 13 | 17 | 44 |
| Maint. (13B) | | | | 4 | 6 | 8 | 9 | 27 |
| Maint. (140) | | | | 8 | 4 | | | 12 |
| Maint. (210) | | | 4 | 8 | 16 | 21 | 23 | 72 |
| Maint. (220) | | | 3 | 5 | 13 | 12 | 14 | 47 |
| Maint. (310) | | 2 | 7 | 15 | 28 | 36 | 80 | 168 |
| TOTAL | 6 | 39 | 51 | 150 | 138 | 158 | 247 | 789 |
| COST PER PERSON | $ 98,539 | $ 81,902 | $ 72,701 | $ 61,061 | $ 49,993 | $ 39,181 | $ 30,826 | |
| TOTAL COST | $ 591,234 | $ 3,194,178 | $ 3,707,751 | $ 9,159,150 | $6,899,034 | $ 6,190,598 | $ 7,614,022 | $ 37,355,967 |
| | | | | | **TOTAL OFFICERS** | | | **13** |
| | | | | | **TOTALENLISTED** | | | **789** |
| | | | | | **SQUADRON TOTAL** | | | **802** |
| TOTAL COST (Officer + Enlisted) | | | | | | | | $ 38,673,374 |
| TOTAL COST PER LIFE OF P-8A (25 Years) | | | | | | | | $ 966,834,350 |

This calculation is then added to the GAO figures from Table 5 to provide a comprehensive cost analysis of military manpower represented in Table 10.

**Table 10. Organic/CLS CMO Manpower Costs (GAO + MPTE)**

| OFFICER | O5 | O4 | O3 | O2 | O1 | CW04 | CW03 |
|---|---|---|---|---|---|---|---|
| MPTE (N10) COST | $127,567 | $109,763 | $90,597 | $74,167 | $57,531 | $110,543 | $95,608 |
| GAO COST (FY04) | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| TOTAL | $183,432 | $165,628 | $146,462 | $130,032 | $113,396 | $166,408 | $151,473 |
| TOTAL REQUIRED | 2 | 6 | 2 | 3 | 0 | 0 | 0 |
| TOTAL COST | $366,864 | $993,768 | $292,924 | $390,096 | $ - | $ - | $ - |
| LIFE CYCLE COST | $9,171,600 | $24,844,200 | $7,323,100 | $9,752,400 | $ - | $ - | $ - |
| ENLISTED | E9 | E8 | E7 | E6 | E5 | E4 | E3 |
| MPTE (N10) COST | $98,539 | $81,902 | $72,701 | $61,061 | $49,993 | $39,181 | $30,826 |
| GAO COST (FY04) | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| TOTAL | $154,404 | $137,767 | $128,566 | $116,926 | $105,858 | $95,046 | $86,691 |
| TOTAL REQUIRED | 6 | 39 | 51 | 150 | 138 | 158 | 247 |
| TOTAL COST | $926,424 | $5,372,913 | $6,556,866 | $17,538,900 | $14,608,404 | $15,017,268 | $21,412,677 |
| LIFE CYCLE COST | $23,160,600 | $134,322,825 | $163,921,650 | $438,472,500 | $365,210,100 | $375,431,700 | $535,316,925 |
| OVERALL TOTAL | $2,086,927,600 | | | | | | |

In order to provide an accurate comparison in cost, the contractor logistics support costs of the 51 contract personnel must be calculated. NAVAIR 4.2 uses a flat rate of $94,000 per military person (Tuemler, 2007, October 12). Based on NAVAIR 4.2's total estimate of $2.161 billion dollars over the 25-year life cycle of the P-8A for the organic/CLS blend, the researchers were able to calculate the CLS costs. Using the flat rate of $94,000, they computed the total military cost as $1,884,700,000, as shown in Table 11.

**Table 11. NAVAIR 4.2 Military Manpower Cost (P-8A Organic/CLS CMO)**

| Personnel Required | Average Personnel Cost | Lifecycle Span (years) | Total Cost |
|---|---|---|---|
| 802 | $94,000 | 25 | $1,884,700,000 |

Based on this computation, the cost for the CLS portion of the blended option is $276,300,000, as shown in Table 12.

**Table 12. NAVAIR 4.2 CLS Cost (P-8A Organic/CLS CMO)**

| Total Cost (4.2) | (-) Organic Military Cost | Total CLS Cost |
|---|---|---|
| $2,161,000,000 | $1,884,700,000 | $276,300,000 |

Combining the granular manpower cost model that is inclusive of the separation of rank with the NAVAIR 4.2 CLS costs, the total cost of the organic/CLS blended option is $2,363,227,600, represented in Table 13 below.

**Table 13. Organic/CLS CMO Manpower Costs (GAO + MPTE)**

| Military Manpower Cost | (+) | CLS Cost | Total Organic/CLS Cost |
|---|---|---|---|
| $ 2,086,927,600 | (+) | $ 276,300,000 | $ 2,363,227,600 |

### 4. Pipeline Costs Associated with Organic CMO Personnel

One aspect of maintenance manpower costs that only applies to options with an organic CMO element is the need for personnel to satisfy a sea/shore rotation. None of the cost analysis conducted by NAVAIR has taken this personnel requirement into consideration. The following calculations will draw in these numbers to represent total cost of options that use Navy personnel and will combine these estimates with the total costs represented in the calculations presented previously. Navy enlisted sea/shore rotation will be analyzed to predict the cost of sea duty personnel required to maintain the 845 enlisted personnel required to man the organic CMO structure and the 789 enlisted manpower requirements for the organic/CLS blended option. The Deputy Head Enlisted Community Manager at the Naval Personnel Command (NPC) states that a 5/3 ratio must be maintained for E1-E6 personnel and a 3/2 ratio must be maintained for E7-E9 or essentially for every 5 E1-E-6 personnel the Navy has on sea duty it must have three personnel on shore for proper balance of sea/shore rotations (Nelson, 2007). The same holds true for the E7-E9 personnel with every three on sea duty; the Navy must have two on shore. Tables 14 and 15 calculate the shore rotation costs for the organic CMO option and organic/CLS blended option.

## Table 14. Organic/CLS CMO Blend Pipeline Cost

| OFFICER | O5 | O4 | O3 | O2 | O1 | CW04 | CW03 |
|---|---|---|---|---|---|---|---|
| **MPTE (N10) COST** | $127,567 | $109,763 | $90,597 | $74,167 | $57,531 | $110,543 | $95,608 |
| **GAO COST (FY04)** | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| **TOTAL** | $183,432 | $165,628 | $146,462 | $130,032 | $113,396 | $166,408 | $151,473 |
| **TOTAL REQUIRED** | 2 | 6 | 2 | 3 | 0 | 0 | 0 |
| **TOTAL COST** | $366,864 | $993,768 | $292,924 | $390,096 | $ - | $ - | $ - |
| **LIFE CYCLE COST** | $9,171,600 | $24,844,200 | $7,323,100 | $9,752,400 | $ - | $ - | $ - |
| **ENLISTED** | **E9** | **E8** | **E7** | **E6** | **E5** | **E4** | **E3** |
| **MPTE (N10) COST** | $98,539 | $81,902 | $72,701 | $61,061 | $49,993 | $39,181 | $30,826 |
| **GAO COST (FY04)** | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| **TOTAL** | $154,404 | $137,767 | $128,566 | $116,926 | $105,858 | $95,046 | $86,691 |
| **TOTAL REQUIRED** | 6 | 39 | 51 | 150 | 138 | 158 | 247 |
| **TOTAL COST** | $926,424 | $5,372,913 | $6,556,866 | $17,538,900 | $14,608,404 | $15,017,268 | $21,412,677 |
| **LIFE CYCLE COST** | $23,160,600 | $134,322,825 | $163,921,650 | $438,472,500 | $365,210,100 | $375,431,700 | $535,316,925 |
| **OVERALL TOTAL** | **$2,086,927,600** | | | | | | |

Table 15. Organic CMO Pipeline Cost

| ENLISTED | E9 | E8 | E7 | E6 | E5 | E4 | E3 |
|---|---|---|---|---|---|---|---|
| MPTE (N10) COST | $98,539 | $81,902 | $72,701 | $61,061 | $49,993 | $39,181 | $30,826 |
| GAO COST (FY04) | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 | $55,865 |
| TOTAL | $154,404 | $137,767 | $128,566 | $116,926 | $105,858 | $95,046 | $86,691 |
| TOTAL REQUIRED | 6 | 37 | 51 | 153 | 143 | 180 | 275 |
| 3/2 RATIO | 4 | 25 | 34 | N/A | N/A | N/A | N/A |
| 5/3 RATIO | N/A | N/A | N/A | 92 | 86 | 108 | 165 |
| TOTAL COST | $620,704 | $3,415,244 | $4,393,100 | $10,733,807 | $9,082,616 | $10,264,968 | $14,304,015 |
| LIFE CYCLE COST | $15,517,602 | $85,381,098 | $109,827,506 | $268,345,170 | $227,065,410 | $256,624,200 | $357,600,375 |
| OVERALL TOTAL | $1,320,361,361 | | | | | | |

To complete the total cost picture, the calculations of manpower must be broken down by these ratios and then summed to the previous totals. Tables 16 and 17 represent the total costs of the organic and organic/CLS blend based on the MPTE/GAO manpower costing model.

Table 16. MPTE/GAO w/Shore Rotation Costs (Organic)

| Military Manpower Cost | (+) | Shore Personnel Cost | Organic CMO Cost |
|---|---|---|---|
| $ 2,307,813,375 | (+) | $ 1,320,361,361 | $ 3,628,174,736 |

Table 17. MPTE/GAO w/Shore Rotation Costs (Organic/CLS Blend)

| Military Manpower Cost | (+) | CLS Cost | (+) | Shore Personnel Cost | Organic/CLS Blend Cost |
|---|---|---|---|---|---|
| $ 2,086,927,600 | (+) | $ 276,300,000 | (+) | $ 1,134,172,630 | $ 3,497,400,230 |

For comparison, the shore rotation costs will be calculated using the NAVAIR 4.2 standard of $94,000 per military person. Tables 18 and 19 represent this analysis.

**Table 18. NAVAIR 4.2 Organic CMO Pipeline Cost**

| ENLISTED | E9 | E8 | E7 | E6 | E5 | E4 | E3 |
|---|---|---|---|---|---|---|---|
| NAVAIR 4.2 RATE | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 |
| TOTAL | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 |
| TOTAL REQUIRED | 6 | 37 | 51 | 153 | 143 | 180 | 275 |
| 3/2 RATIO | 4 | 25 | 34 | N/A | N/A | N/A | N/A |
| 5/3 RATIO | N/A | N/A | N/A | 92 | 86 | 108 | 165 |
| TOTAL COST | $377,880 | $2,330,260 | $3,211,980 | $8,629,200 | $8,065,200 | $10,152,000 | $15,510,000 |
| LIFE CYCLE COST | $9,447,000 | $58,256,500 | $80,299,500 | $215,730,000 | $201,630,000 | $253,800,000 | $387,750,000 |
| OVERALL TOTAL | $1,206,913,000 | | | | | | |

**Table 19. NAVAIR 4.2 Organic/CLS Blend CMO Pipeline Cost**

| ENLISTED | E9 | E8 | E7 | E6 | E5 | E4 | E3 |
|---|---|---|---|---|---|---|---|
| NAVAIR 4.2 RATE | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 |
| TOTAL | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 | $94,000 |
| TOTAL REQUIRED | 6 | 37 | 51 | 153 | 143 | 180 | 275 |
| 3/2 RATIO | 4 | 25 | 34 | N/A | N/A | N/A | N/A |
| 5/3 RATIO | N/A | N/A | N/A | 92 | 86 | 108 | 165 |
| TOTAL COST | $377,880 | $2,330,260 | $3,211,980 | $8,629,200 | $8,065,200 | $10,152,000 | $15,510,000 |
| LIFE CYCLE COST | $9,447,000 | $58,256,500 | $80,299,500 | $215,730,000 | $201,630,000 | $253,800,000 | $387,750,000 |
| OVERALL TOTAL | $1,206,913,000 | | | | | | |

These calculations are then added to NAVAIR 4.2's initial numbers provided and are identified in Tables 20 and 21 as a total military manpower cost requirement.

**Table 20. NAVAIR 4.2 w/Shore Rotation Costs (Organic)**

| Military Manpower Cost | (+) | Shore Personnel Cost | Organic CMO Cost |
|---|---|---|---|
| $ 2,100,000,000 | (+) | $ 1,206,913,000 | $ 3,306,913,000 |

**Table 21. NAVAIR 4.2 w/Shore Rotation Costs (Organic/CLS Blend)**

| Military Manpower Cost | (+) | CLS Cost | (+) | Shore Personnel Cost | Organic/CLS Blend Cost |
|---|---|---|---|---|---|
| $ 1,884,700,000 | (+) | $ 276,300,000 | (+) | $ 1,047,982,500 | $ 3,208,982,500 |

### 5. Cross Comparison of All Manpower Cost Estimates

A comparison of all estimates must be made to consolidate the information provided in the manpower analysis. If only the costs of the manpower slated for sea duty are computed in the comparison, the organic CMO and organic/CLS blended options are much cheaper than an OEM-CLS construct. Figure 12 displays the large separation in costs between an OEM-CLS model, the organic, and the organic/CLS blended options.

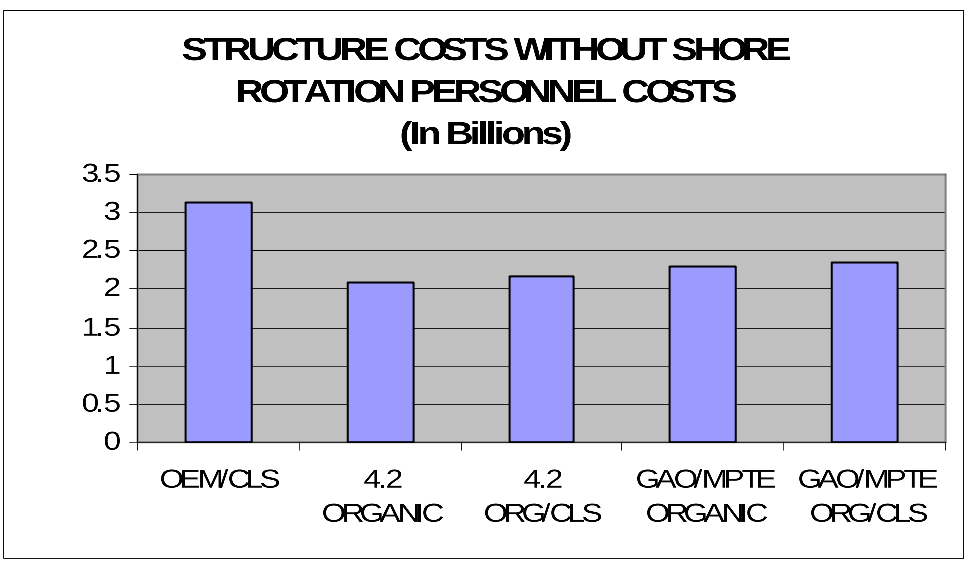



**Figure 12. Total Cost Comparison without Shore Rotation Costs**

Once the shore rotation personnel are added into the computations, the cost of the OEM-CLS model becomes significantly less expensive than the other models (as depicted in Figure 13).

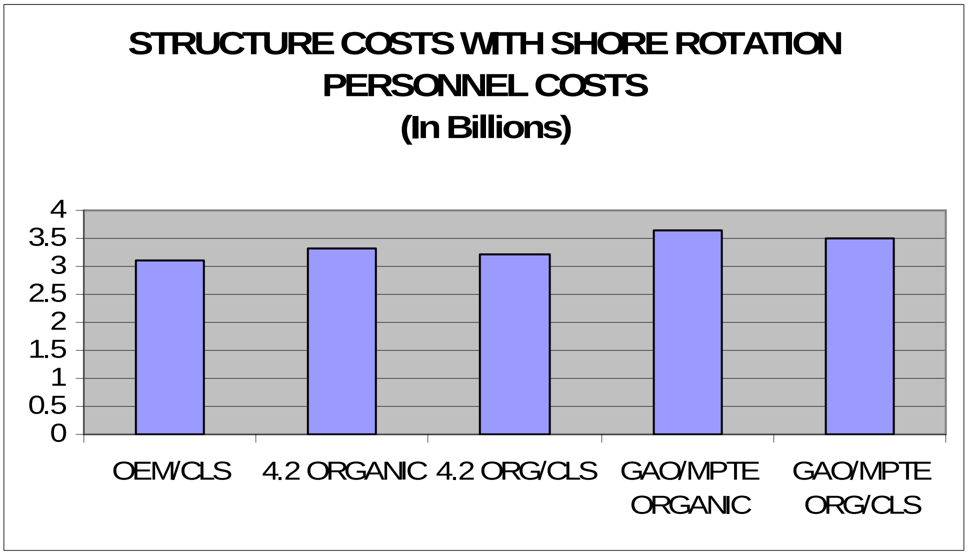



**Figure 13. Total Cost Comparison with Shore Rotation Costs**

### 6. Naval Personnel Command (4011D) FAC-G Billets

FAC-G shore billets are for enlisted personnel who will transfer from sea duty to a billet that is non-traditional, or not specifically related to their career field. There are currently 10,110 shore duty FAC-G billets Navy-wide (Bryant, 2007). Aviation ratings make up 1887 or 18.4% of these billets. These billets are comprised of Navy-specific requirements. The number of aviation personnel assigned is broken down by rate, but is not tied to a specific aviation platform. A list of common billets is provided in Table 22 below.

**Table 22. FAC-G Billets**

| FAC-G BILLETS | |
|---|---|
| **General Instructor Duty** | **Gymnasium Attendants** |
| **Facility Manager** | **3M Coordinator** |
| **Safety Coordinator** | **Airport Liaison** |
| **Barracks Petty Officer** | **Disaster Preparedness** |
| **Urinalysis Coordinator** | **Administrative Assistant** |
| **Corrections Specialist** | **Assistant Ship Supervisor** |
| **Recruiter** | **Hobby Shop Attendant** |
| **Equal Opportunity Coordinator** | **Recruit Company Commander** |
| **Casket Bearer** | **Master at Arms** |
| **Drug and Alcohol Counselor** | **Other General Billets** |

A billet that is designated for an ABH1 can be filled by any ABH1, regardless of whether they are currently assigned to a P-8A squadron, an F-18 squadron, or attached to a ship (Bryant, 2007). Because of how the billets are filled, it is unknown what impact the removal of between 789 to 845 enlisted personnel would be if an OEM-CLS option were implemented. A potential increase in manpower could be necessary to fill the gap created by replacing these enlisted personnel with contractors.

### 7. Congressional Funding

Congressional Military Appropriations

Congress provides funds for defense using specific appropriations. Jones and McCaffery outline these specific appropriations as follows:

*Military Personnel*:

This includes, among other things, pay for uniform personnel, housing and uniform allowances, bonuses, contributions to military retirement funds, travel for permanent change of station, and National Guard and Reserve pay for drill and training. This title is intended to hold all the direct costs of maintaining uniform personnel, officer and enlisted.

*Operations and Maintenance*:

Included is funding to operate military facilities and most of the annual operating expenses in DoD.

*Procurement*:

Included is funding for acquisition of military hardware assets including aircraft, ships, tanks, and weapons systems. Procurement legislation is broken down further by Congress into appropriations for specific types of hardware by military service, for example, Aircraft Procurement, Navy (APN).

*RDT&E*:

Included is funding for most DoD research, development, testing, and evaluation of military weapons and systems

*Family Housing*:

Included is funding for construction of housing for military personnel in the U.S. and abroad.

*Revolving and Management Funds*:

Included is core funding to support semi-autonomous DoD operating entities including Navy shipyards, DOD logistics operations, and other revolving fund entities supported by reimbursements for service payments (McCaffery & Jones, 2004, p. 58).

These appropriations are bound by law. Obligating funds from one appropriation to cover expenditures is not authorized and is in violation of the *Anti-Deficiency Act* (GAO, 2007).

Congressional Funding for the Department of Veterans' Affairs

The primary focus of funds within the Department of Veterans' Affairs are honorably discharged and retired personnel, but currently the benefits of the Montgomery GI Bill and Guaranteed Home Loan Program are eligible for active duty members (GAO, 2005).

These benefits not reflected in the DoD budget are a portion of the monetary benefits that specifically relate to the cost of an active duty member.

Congressional Funding for the Department of Education

Funding to school districts is provided under the Congressional appropriation for the Department of Education for those that would lose money due to the loss of tax revenue generated from a military presence and their military dependents (GAO, 2005). The tax compensation costs to the federal government are equal to the number of military personnel assigned within this program that are eligible for this benefit (GAO, 2005).

Transparency of Cost

This research could not find a governmental method of extracting the cost of an individual sailor from each Congressional Appropriation or Budget Authority.

> The lack of transparency over total costs to compensate service members impacts decision makers' ability to manage the system, including (1) assessing the long-term cost implications, (2) determining how best to allocate resources to ensure an optimum return on investment, and (3) assessing the efficiency of the current compensation system on DoD's ability to meet recruiting and retention goals. As a result, the current compensation system is made up of a number of benefits and over 60 different pays and allowances that have been piecemeal over the years to address specific needs (GAO, 2005, p. 12).

The military compensation package receives monies that are tied to multiple appropriations within the Department of Defense and is a part of the budgets of several other departments. The compensation funding from each of these appropriations must be paid from these accounts in accordance with the *Anti-Deficiency Act*. The GAO conducted an analysis of the summary of changes in compensation in the Department of

Defense between 2000 and 2004 represented in Figure 14 below. These figures represent a total of $158.1 billion dollars spent on compensation in 2004. Only $114.2 billion dollars ($98.5 billion under Title I manpower and $15.7 billion under Title VI) can be directly linked to the Defense Appropriation Bill passed into public law as PL-108-87.

2004 constant dollars in billions

| Components of compensation | Fiscal year 2000 | Fiscal year 2004 | Percentage change |
|---|---|---|---|
| **Cash** | | | |
| Basic pay | $38.4 | $47.4 | 23 |
| Housing allowance | 7.3 | 12.0 | 66 |
| Subsistence allowance | 3.1 | 3.4 | 8 |
| Special and incentive pays | 3.3 | 4.3 | 30 |
| Allowances | 1.9 | 3.5 | 84 |
| Tax advantage | 5.3 | 6.4 | 22 |
| **Total cash** | **59.3** | **77.0** | **30** |
| **Noncash benefits** | | | |
| Subsistence in kind | 1.2 | 3.5 | 185 |
| Other[a] | 10.3 | 10.0 | (3) |
| Education[b] | .4 | .7 | 68 |
| Installation based benefits[c] | 4.4 | 5.2 | 20 |
| Health care | 8.7 | 9.7 | 11 |
| Family housing and barracks | 3.2 | 3.1 | (1) |
| **Total noncash** | **28.2** | **32.2** | **14** |
| **Deferred benefits** | | | |
| Retired pay accrual | 12.2 | 12.8 | 5 |
| VA compensation and pension | 9.0 | 11.1 | 23 |
| VA health care | 8.4 | 10.3 | 23 |
| VA other | .9 | 1.1 | 23 |
| Health care accrual | 5.1 | 13.6 | 166 |
| **Total deferred** | **35.6** | **48.9** | **38** |
| **Total compensation** | **$123.1** | **$158.1** | **29** |

Source: GAO analysis.

Notes: According to DOD officials, there were over 100,000 mobilized reservists paid out of the cash compensation in fiscal year 2004. For more detail on sources, see app. I.

[a] Includes separation pay, partial dislocation allowance, transportation subsidy, permanent change of station, adoption expenses, savings deposit program, other personnel support, special support, social security tax, unemployment benefits, special compensation, VA home loan, death gratuities, survivor benefits, and other costs.

[b] Includes education, off-duty voluntary education, and servicemember GI bill and certification.

[c] Includes exchanges, commissaries, childcare, DOD dependent schools, and other morale, welfare, and recreation costs.

**Figure 14. Summary of changes in compensation costs, fiscal years 2000 and 2004 (from GAO, 2005, p. 19)**

Tax advantages of $6.4 billion are represented as a cash benefit for a service member, but cannot be linked to any specific appropriation, because it is money earned by not paying taxes on certain allowances. $22.5 billion are appropriated under the Department of Veterans Affairs, and fully $12.5 billion (subsistence in kind, education, installation based benefits, and family housing and barracks) are spread across many different appropriations and lines of accounting.

When comparing military manpower costs to an OEM-CLS construct, the Navy P-8A must account for the true cost savings that will be realized. Based on GAO Report GAO-05-798, the P-8A Program Manager would have to convince the Secretary of Defense, the Secretary of Veterans Affairs, the Secretary of Education, and the Secretary of the Navy to concede to a salami slice budget cut proportional to the rate structure devised in the GAO analysis and convince Congress to reprogram these funds into Defense Operations and Maintenance Funding or a Defense Working Capital Fund for payment to the contractor on a yearly basis. Mr. Jeffrey Heron, the Director of NAVAIR's PBL Office states that "after 10 years of effort on single line of accounting (SLA) with numerous failed NAVAIR SLA legislative proposals (LEGPRO's) NAVAIR is reluctant to initiate SLA LEGPRO's" (2007). If these organizations cannot be convinced of a salami slice reprogramming of funds, a cost comparison must be created based on the status quo of Congressional appropriations to increase fidelity in the analysis. Table 5 represents modified figures based on the GAO/MPTE compensation model developed during this research. The NAVAIR 4.2 numbers were not used because their breakdown of compensation factors was not provided for this study.

In this revised calculation of compensation benefits, all VA budget items have been removed, the federal tax advantage is not realized as a savings to the US Navy, and the spread of benefits for installations, family housing, education, and other benefits are assumed to be negligible, due the fact that the 789 to 845 enlisted personnel represent less than 0.25% of Navy personnel

**Table 23. GAO Compensation Costs (Minus Non-Navy Savings)**

| NON-CASH BENEFITS | AVG COST |
|---|---|
| Health Care | 6829 |
| Installation-Based Benefits | 3700 |
| Family Housing and Barracks | 2221 |
| Education | 466 |
| Other Benefits | 7093 |
| Total: | 20309 |
| | |
| DEFERRED BENEFITS | |
| VA Compensation & Pension | 7839 |
| VA Health Care | 7303 |
| VA Other | 771 |
| Health Care Accrual | 9643 |
| Total: | 25556 |
| | |
| CASH COMPENSATION | |
| Special and Incentive Pays | 3021 |
| Other Allowances | 2441 |
| Federal Tax Advantage | 4538 |
| Total: | 10000 |
| | |
| Total GAO Compensation (minus MPTE program rates) | 55865 |
| Minus Benefits not paid in cash or average per person | 33931 |
| **Total Traceable Compensation** | **21934** |

Based on these reductions in GAO compensation, the previous MPTE/GAO cost analysis was used, replacing the $55,865 per person compensation package with $21,934. Tables 24 and 25 represent the adjusted manpower cost for this reduction for calculations that include total cost with and without consideration for the shore rotation pipeline.

## Table 24. Navy Only Savings with Shore Rotation Costs

i. Organic/CLS Blend Cost

| Military Manpower Cost | (+) | CLS Cost | (+) | Shore Personnel Cost | Total |
|---|---|---|---|---|---|
| $ 1,406,611,050 | (+) | $ 276,300,000 | (+) | $ 755,884,394 | $ 2,438,795,444 |

ii. Organic Cost

| Military Manpower Cost | (+) | Shore Personnel Cost | Total |
|---|---|---|---|
| $ 1,557,090,000 | (+) | $ 884,704,286 | $ 2,441,794,286 |

## Table 25. Navy Only Savings without Shore Rotation Costs

i. Organic/CLS Blend Cost

| Military Manpower Cost | (+) | CLS Cost | (+) | Shore Personnel Cost | Total |
|---|---|---|---|---|---|
| $ 1,406,611,050 | (+) | $ 276,300,000 | (+) | $ 0 | $ 1,682,911,050 |

ii. Organic Cost

| Military Manpower Cost | (+) | Shore Personnel Cost | Total |
|---|---|---|---|
| $ 1,557,090,000 | (+) | $ 0 | $ 1,557,090,000 |

When making the comparison between OEM-CLS, an organic CMO, and an organic/CLS blended option based solely on savings to Navy, the analysis is completely reversed from the cost comparisons previously presented. Figures 15 and 16 display the cost comparison between the three choices with and without shore rotation costs.

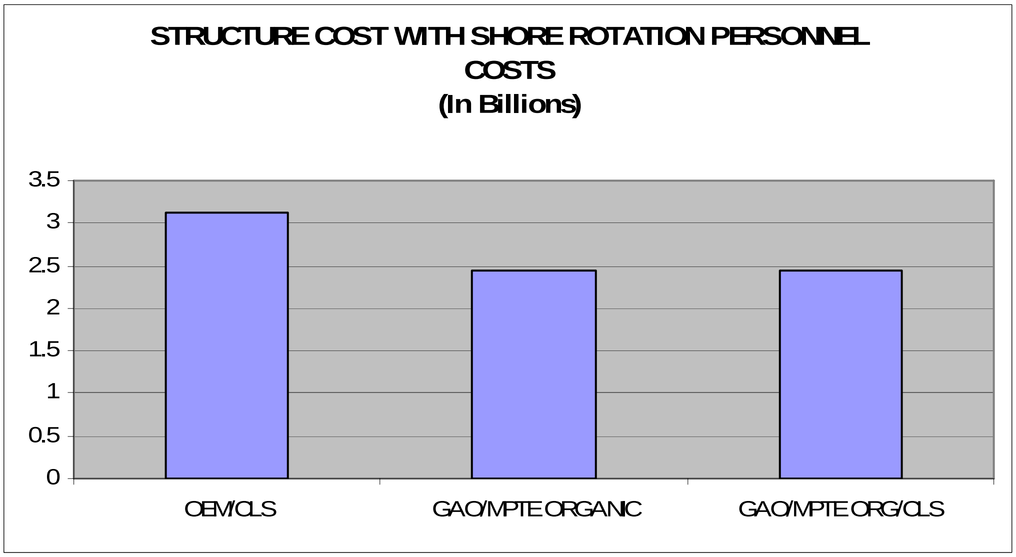



**Figure 15. OEM/CLS & MPTE/GAO Comparison with Shore Rotation Costs**

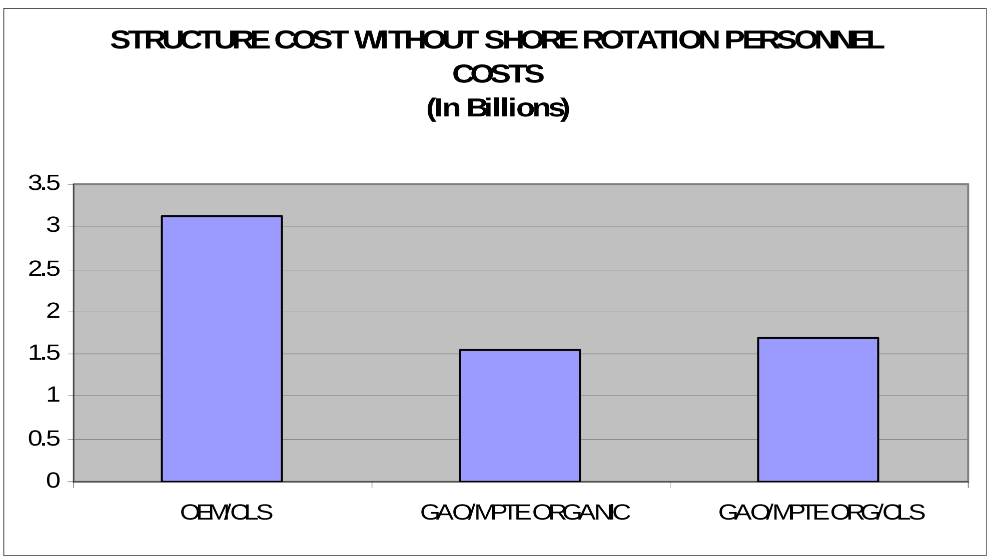



**Figure 16. OEM/CLS & MPTE/GAO Comparison without Shore Rotation Costs**

## B. PROBLEMS ASSOCIATED WITH CLS AND OEM FROM THE MAINTENANCE STANDPOINT ANALYSIS

As the Navy approaches the acquisition of the P-8A Poseidon to replace the aging

P-3 Orion, it is necessary to explore the areas of concern for consideration during the acquisition process. The very nature of past performances and future defense authorizations, gives the Navy the responsibility to utilize a fair and objective analysis of the maintenance side of the process, looking at Naval Aviation Maintenance Program (NAMP) procedures and how they will be maintained against the Consolidated Continued Airworthiness Maintenance Plan (CAMP). Utilizing past experience from Boeing and its commercial best practices, it is evident that the NAMP Contractor instructions (NCI's) being simultaneously developed by Boeing and the use of the CAMP will indeed fulfill the objectives of the NAMP. The following is an analysis if each part of the before mentioned areas to take a conscientious look and give a well-rounded view before making a clear and final decision on whether to choose fully OEM-CLS, organic OEM or a blended organic OEM-CLS.

### 1. NAMP/CAMP

All aircraft maintenance performed by or for the U.S. Navy, must be done under the direction and guidance in the Naval Aviation Maintenance Program (NAMP). The NAMP is an integral part of the way Naval Aviation Maintenance is conducted and controlled. The NAMP instruction, *OPNAV 4790.2*, outlines command, administrative and management relationships and establishes procedures for assignment of maintenance responsibilities and tasks. It is the basic document and authority governing the management of all naval aviation maintenance (Zortman, 2005, p. 4).

The maintenance of naval aircraft has continually changed and evolved over the lifetime of naval aviation. Aircraft maintenance processes and procedures have become increasingly complex as aircraft and aircraft systems have become more complicated. Maintenance techniques have progressed from the pilot performing maintenance and keeping records to today's intricate, integrated aircraft systems requiring teams of highly trained and qualified professional maintenance personnel. The NAMP was established by the Chief of Naval Operations (CNO) to provide an integrated system for performing aeronautical equipment maintenance and related support functions. Because of the dynamic natures of the NAMP, it has been periodically revised to incorporate improved maintenance and data collection methods and techniques (pp. 1-2).

The objective of the NAMP is to meet aviation readiness and safety standards established by the CNO. This is accomplished by optimizing the use of manpower, material, facilities and financial resources per policy guidance and technical direction provided by instruction and by related implemented directives. The NAMP provides for the maintenance, manufacture and calibration of aeronautical equipment and material at the level of maintenance that will ensure optimum use of resources. It further provides for the protection of weapon systems from corrosive elements through an active corrosion control program, and the application of a systematic planned maintenance program. Finally, it provides for the collection, analysis, and use of pertinent data to achieve cost-wise-readiness goals (Zortman, 2005).

When a contractor is awarded a contract for aviation maintenance, it must follow the NAMP, however this is not always the case. New instructions must be written or guidance must be provided. For the P-8A, Boeing has developed the CAMP. This is a draft document established to provide guidance as to how the Navy will ensure, for the life of the fleet, continued airworthiness of the P-8A commercial common parts that may be exchanged within the civil aviation industry. This plan will use the Federal Aviation Administration (FAA) term “dual use” for these parts and is further defined in FAA Order 8130.2F and AC 20-142. The objective of this plan is to set forth the basic requirements that will be used to support operational units (Howery, 2007).

The CAMP is a document to explain the guidance for CLS throughout the life support of the P-8A. The CAMP stresses the use of airframe and power plant (A&P) mechanics to adhere to FAA regulation and requirements and OEM procedures for continued airworthiness relation to the P-8 dual use exchange pool of P-8A parts (p. 6). The ultimate objective of the Navy and the CAMP would be to award a contract to an aviation maintenance contractor that will foresee and oversee the necessary maintenance to maintain readiness capability, thus, in a sense, a governing or “umbrella” contractor with one point for liaison with the Navy commanders, vice many contractors for the various systems of the P-8 aircraft and management of third party contractors as required. The CAMP is a document to meet the requirements of the NAMP without using the NAMP directly, but using FAA practices already in place.

To ensure continued airworthiness of the P-8A, all maintenance, preventative maintenance, and alteration on parts in the dual use parts exchange pool will be performed in accordance with *Title 14 CFR 21, 43,* and *145* (p. 6). The P-8A will utilize a commercial based two level maintenance concept consisting of line and depot level maintenance and developed through the MSG-3 process. FAA requirements for airworthiness of the dual use parts will be maintained (Howery, 2007, p. 6). This however could be confusing to the way the Navy does business in aviation in accordance with the NAMP. This means that a "blue shirt" mechanic enlisted in the Navy cannot perform maintenance on the P-8A's aircraft airframe and components. The cost of training and certifying each blue shirt would be astronomical. With the use of a blended OEM-CLS approach, the Navy would get the use of the CAMP/NCI as well as using blue shirts for this purpose in mostly support roles. This is the very basis for a blended OEM-CLS approach.

Many of the P-3 squadron commanders interviewed stated concern with getting contractors to certain areas of operations throughout the world. If this would be the case, then there would not be anyone that could perform maintenance on the P-8. What if an emergency deployment came about and the squadron commander had less than 24 hours to put together a maintenance team to go into a hostile country to repair a down aircraft? Many expressed concern about getting a contractor to the aircraft. Many were concerned that travel, passports and visas would be difficult to get in that amount of time. One major concern was the fact that a civilian could just quit if they did not like the current situation.

On the other hand, a military member has many benefits with travel through foreign or hostile countries. The Status of Forces Agreement (SOFA) allows travel without passport to military members and DoD personnel. The lack of SOFA coverage has already been a problem amongst contractor personnel as stated by the Maintenance

Material Control Officer (MMCO) of VR-51 (MMCO, LCDR, Navy squadron VR-51, 2008, January 22). He has stated that VR-51's CLS provider, M7 Aerospace, Inc., has had times in the past when they had trouble getting a visa in a timely manner and also had difficulty entering countries and getting through customs. This is not an apparent problem with military and the SOFA.

P-8A Multi Mission Aircraft NAMP Contractor instructions (NCIs) were developed jointly by the Navy and Boeing Integrated Defense Systems (IDS) to ensure use of best commercial practices. Development was established so the P-8A CLS maintenance program meets the intent of *COMNAVAIRFORINST 4790.2*, which is inline with the program guidance of the NAMP. These NCIs are applicable to all P-8A sites, CLS maintenance and subcontractor personnel. They establish responsibility and requirements for implementing programs as outlined in *COMNAVAIRFORINST 4790.2*. Change recommendations to these NCIs will be submitted to the Fleet Support Center (FSC) QA manager and COMNAVAIRSYSCOM PMA 290 via the site QA manager in accordance with NCI-44, NCI formal change procedures ("Joint Document," 2007, p. 1).

### 2. Commercial Best Practices

Best practices are the best ways to perform any business process. They describe optimum ways for more efficient organizational processes. They can be a means for achieving top performance while setting goals for an organization striving for excellence.

According to a 1999 GAO report, the DoD believes that best practices of leading commercial firms can be used to improve the development of technology and weapon systems in the DoD. In particular, knowledge standards that are rigorously applied, coupled with the practice of keeping technology development separate from product development, stand out as key factors in the most successful commercial examples. These practices have put managers in the best position to succeed in developing better products in less time and producing them within estimated costs. DoD programs, with some exceptions, proceed with lower levels of knowledge available about key factors of product development, such as proof of design maturity and production readiness. In addition, the DoD allows technology development to take place during product development. These practices put DoD program managers in a much more difficult position to deliver better weapons more quickly and within cost projections (GAO, 1999, p. 1).

Getting better outcomes on weapon system programs will take more than attempting to graft commercial best practices onto the existing acquisition process. There are underlying reasons and incentives for why such practices are not a natural part of weapon systems acquisition. Environmental factors, such as the intense competition for funding when a program is launched, encourage lower standards of technologies and the acceptance of higher, but unrecognized, risks. What the researchers offer to help in the adoption of best practices is not a cookbook recipe, but a series of actions aimed at fostering an environment in the DoD that encourages or rewards such practices. These actions will put managers of DoD programs in a better position to succeed, as they are as informed and capable as their commercial counterparts (p. 2).

The "best practices" model for acquisition suggests a process for developing new capabilities, whether they are commercial or defense products, which are based on corporate knowledge and experience. It is a process in which technology development and product development are treated differently and managed separately. Developing technology culminates in discovery and must, by its nature, allow room for unexpected results and delays. Developing a product culminates in its delivery, and therefore, gives great weight to design and production. Discipline is inherent because criteria exist, tools are used, and a program does not go forward unless the strong business case on which the program was originally justified continues to hold true (GAO, 1999, p. 2). This is a most beneficial system in use by Boeing. Boeing has been working with the government for the past 70 years on contracts and best practices. They have the upper edge when it comes to development and design. With a platform such as the 737-800 already in use around the world, there is a baseline of "best practices" in use.

In the past several years, the DoD has examined best practices used by world class commercial firms such as Boeing, Chrysler, Hughes, Ford, and 3M, and individual DoD acquisition programs for weapons such as the F-22, the C-17, the Comanche, the New Attack Submarine, and the Advanced Amphibious Assault Vehicle with the objective of finding best practices for developing and producing major weapon systems. The research has examined best practices for quality assurance, earned value management, supplier management, and transitioning products from development to production (GAO, 1999).

The DoD has learned that a knowledge-based process is essential to getting better cost, schedule, and performance outcomes. The commercial and military programs did not all follow the same processes in their development cycles. However, at some point, full knowledge was attained about a completed product, regardless of what development approach was taken. This knowledge can be broken down into three junctures, which are referred to as knowledge points:

- When a match is made between the customer's requirements and the available technology.

- When the product's design is determined to be capable of meeting performance requirements.

- When the product is determined to be producible within cost, schedule, and quality targets.

With the selection of the Boeing 737-800 aircraft to meet the needs of replacing the P-3 Orion, these three knowledge points have already been met. Metrics were identified that indicate the knowledge levels associated with best practices and can thus help forecast problems as the development program progresses. An important corollary to having a knowledge-based process is that technology development should take place separate from an acquisition program and its related product development process. The knowledge points and their associated metrics are depicted in Figure 17 (GAO, 1999. p. 3).

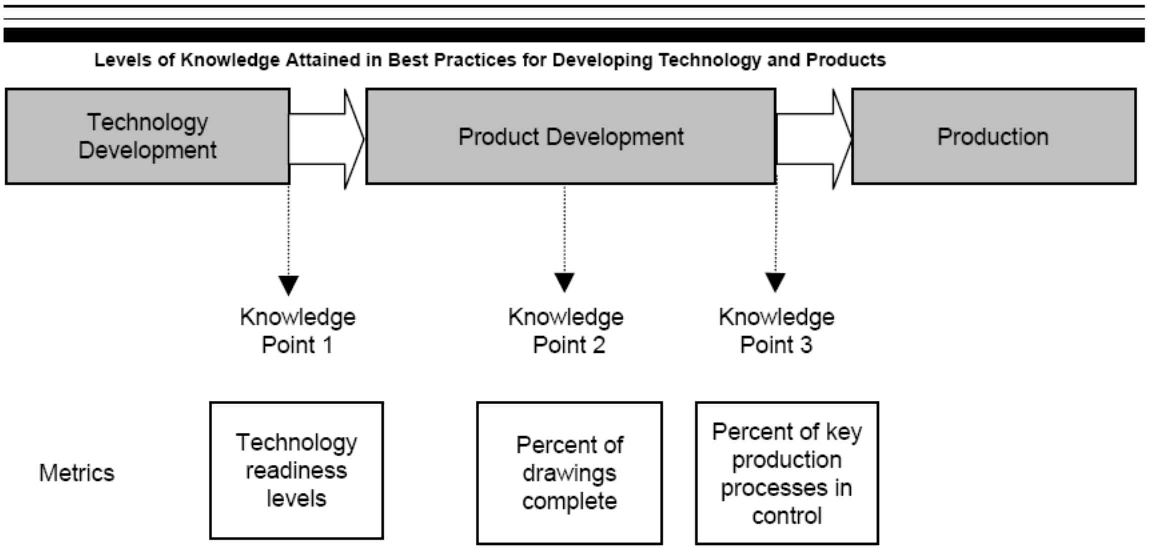



**Figure 17. Levels of knowledge attained in Best Practices for developing technology and products (from GAO, 1999, p. 4)**

### 3. Quality Assurance

Based on a study performed for the DoD, it has been estimated that the DoD spends more than $1.5 billion annually beyond what is necessary to support its quality assurance approach. Despite this outlay, it has had long-standing problems with significant cost and schedule overruns that have been needed to correct manufacturing and quality problems on weapon system programs. Historically, numerous acquisition programs have had quality problems in production because designs were not complete (GAO, 1996, p. 2). During this study, the B-2 Bomber program and the C-17 Airlifter program encountered major manufacturing problems because they went forward with unstable designs and relied on inspections to find and rework defects once in production. More recently the F-35 Joint Strike Fighter (JSF) and the F-22 Raptor encountered the same problems (p. 2).

Non value-added costs have increased in part because the DoD has taken a narrow approach to implementing its quality standard. On the other hand, a number of successful commercial manufacturers have adopted a dramatically different approach. Driven by the competitive imperative, they have significantly improved quality in their products, while reducing oversight and inspection costs. The striking difference between the way the DoD's weapon system programs and world-class companies practice quality assurance is that the latter defines quality assurance much more broadly, making it an integral part of the entire process from development through production to sales. Several key techniques are common to this approach:

- Focusing on achieving robust, producible designs before production begins by requiring communication between key players.
- Using process controls to design products and control the production process as it occurs.
- Establishing programs with key suppliers to ensure the quality of incoming material.

When the GAO visited commercial manufacturers, they reported that these techniques have helped reduce defects from 34 to 90 percent and the number of inspectors from 25 to 94 percent (GAO, 1996, p. 3).

The DoD faces a formidable challenge in changing its quality assurance culture. This culture has been characterized by a narrow approach to quality assurance, in both the DoD and the defense industry, which has led to a focus on detecting defects and recording corrective actions. In the past, the DoD's practices have reflected a narrow approach to quality assurance (p. 3). The DoD is attempting to change its approach to quality by including design in the definition of quality. In translating this approach into practice, the DoD will have to overcome a history in which many weapon system acquisitions have encountered significant cost and schedule overruns because of design and manufacturing problems. These problems usually resulted from acquisition strategies that began production before the design was complete and before key manufacturing processes were in place and tested for capability (p. 5).

During the researchers' interview of two Quality Assurance Representatives (QAR) from the 65th Airlift Squadron at Hickam AFB, the use of contractors in the repair and maintainability was better than they had seen while in the service. They were both retired military, one from the Air Force and the other from the Army (QAR supervisors, 65th airlift squadron, 15th Airwing, Hickam AFB, Hawaii, January 23, 2008). They stated that the quality of work performed by the contractors was done with few repeat discrepancies and very little problems with quality of workmanship. Most of the contractors from the 15th Air Wing and the various other maintenance facilities were either retirees or veterans with military experience and understood the military way of doing business. The apprentices that had no prior military experience were typically indoctrinated by the vast network of military veterans hired by the contractors.

### 4. Contract Management and Oversight

Federal spending for goods and services has changed significantly in recent years. The government now spends more on services—ranging from basic maintenance to running computer systems—than on supplies and equipment. The government acquisition process has also changed in terms of how the government buys. In particular, the process has become more streamlined as new contract vehicles and techniques have allowed agencies to buy what they need much faster than in the past. To streamline its own acquisitions, the Department of Defense (DoD) is making extensive use of contracts awarded by other agencies, including contracts that the General Services Administration (GSA) awards to multiple companies supplying comparable products and services under the Federal Supply Schedule (GAO, 2000, p. 3). One such contract is being negotiated with Boeing for the CLS portion of the P-8 lifecycle. In an interview with the researchers, the MMCO of VR-51 has also stated that any contract awarded to perform CLS maintenance must be implemented carefully and without any dismal procedures left for interpretation (MMCO, LCDR, Navy squadron VR-51, January 22, 2008).

The GAO did a study on contracting officers, the procedures they used for granting contracts and the basis of awarding those contracts. What they found was that most DoD contracting officers did not follow GSA’s established procedures intended to ensure fair and reasonable prices when using the Federal Supply Schedule. In fact, 17 of the 22 orders (valued at $60.5 million) were placed without seeking competitive quotes from multiple contractors. Instead, contracting officers often relied on a comparison of labor rates of various contractors listed on the Federal Supply Schedule, and generally ended up placing the orders with incumbent contractors. Relying on labor rates alone does not offer an agency a good basis for deciding which contractor is the most competitive, since it does not reflect the full cost of the order or even critical aspects of the service being provided (GAO, 2000, p. 4).

By not following the Federal Supply Schedule requirement for competitive quotes, the DoD has significantly undermined its ability to ensure that it is getting the best services at the best prices. Moreover, the lack of clear guidance on when to seek competitive quotes for services has increased the risk that agencies will not identify and acquire the lowest cost alternatives to meet their needs. This GAO report made recommendations for GSA and the Office of Federal Procurement Policy aimed at promoting more competition for orders and providing additional guidance to agencies using the Federal Supply Schedule (GAO, 2000, p. 5).

When it came to contract oversights, a 2004 GAO report came up with the following conclusions, stating that the DoD's contract oversight processes were generally good, although there was room for improvement (GAO, 2004). DoD customers have not always ensured that contractors provide services in an economic and efficient manner, although they have a responsibility to do so. The report found that when the customer reviews the contractor's work for economy and efficiency, savings were realized. Under one Army contract, months-long delays in *definitizing* contract task orders frequently undermined the contractor's cost-control incentives, and the absence of an award fee board to comprehensively evaluate the contractor's performance further limited the DoD's oversight (p. 1).

The results came to state that the DoD did not have sufficient numbers of trained personnel in place to provide effective oversight of its logistics support contractors. The Army has deployed units responsible for supporting these contracts, but some of the personnel have little knowledge of the contract. The Air Force did not consistently train evaluators to monitor its logistics support contractor's performance. Military units across the services receiving contractor support have lacked a comprehensive understanding of their roles and responsibilities, which include establishing the work to be done by contractors and monitoring contractors' performance (GAO, 2004, p. 2).

It is clear that the need for contract oversight is very important. What is yet to be seen is the need to develop a rock solid, bulletproof contract that the Navy can use before going forward with the P-8 program. The development of an extensive, carefully constructed contract for CLS is imperative. After many interviews and sight visits, the researchers have uncovered issues that should be addressed before a contract is awarded for the CLS portion of maintenance on the P-8A Poseidon.

In interviews that were conducted, from the commanders of the P-3C squadrons (CO/XO, VP units, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008) and the wing commander (Chief of Staff, CDR, PATWING CPRW-2, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008),the researchers found that the need to have flexibility in the contract to be able to get personnel to the many corners of the world at the drop of a hat was a major issue. Many were concerned with being able to get a contractor to hostile countries with bullets flying overhead. Sailors are bound by the oath they took when they entered the Navy. Contractors are only bound by the contracts they signed. Contractors can quit when they want, a sailor does not have that right. This could be the difference between getting a job done, or having someone walk out on the squadron or Navy just as they are needed the most.

A contract for CLS maintenance needs to have many variables accounted for in the fine print of the contract. One of the problems found from VR-51's contract with M7 Aerospace, Inc. was that many details left out of the contract. What wasn't covered in the contract has to be dealt with by the MMCO each time and a request for monies and funds are needed to pay for the "above and beyond" costs associated with maintenance during travel to repair aircraft that have been downed for a maintenance discrepancy.

In Figure 18, the costs associated with the "above and beyond" paperwork are broken down (MMCO, LCDR, Navy squadron VR-51, January 22, 2008). These are the costs not figured into the original contract. As noted in the example in Figure 18, these costs added up quickly for only two people. This is a cost not included in NAVAIR 4.2 cost analysis. This is an unknown type of variable that would be difficult to predict, due to the very nature of anticipating the when and where of maintenance problems.

Many questions arise from the emergence of these “above and beyond” costs. Who is going to pay for them? Should they be implemented into the contract or should they be dealt with on an “as needed” basis? Military personnel are regularly immunized to the world’s most dangerous pathogens and viruses. Contractor personnel are not required to get these inoculations, but would need them if entering a foreign, third world country.

The list of “above and beyond” costs presented so far is incomplete. For example, Visas are not addressed. The example in Figure 18 did not include a visa cost, but these are not cheap and sometimes take a few days, weeks or even months to obtain. The VR-51 MMCO interviewed stated that the per diem rate was “a nightmare to figure out” as illustrated in the example in Figure 18 (MMCO, LCDR, Navy squadron VR-51, January 22, 2008). This was due to multiple stays in different states and countries prior to arrival at destination. The deployment premium and hazardous premium were additional expenses the contractors were not prepared for and the overtime expenses were extraordinary. In his history as a civilian contractor, the MMCO had even heard some of the contractors’ resorting to bribery to get through some customs in various not-so-friendly countries.

**Misa Job # 7157**
**Event # 06-009**

Presumptions:

| | | | |
|---|---|---|---|
| 2 personnel required | | | |
| Anticipated departure date: 3 Mar 06 | | | |
| Anticipated return date: 29 Mar 06 | 27 Days | | |
| Per Diem in lieu of subsistence reimbursement | | | |
| Deployment is not to a hazardous area | | | |
| M7 Deployment Compensation Plan in Effect | | | |
| Anticipated Overtime: 4 hours per week day, 24 hours per weekend | | | |
| Gov will reimburse additional required/authorized overtime | | | |
| No additional immunizations required | | | |
| Medical Evaluations | | $ | - |
| Rental car required | | $ | 359.16 |
| Vehicle Fuel Allotment | | $ | 113.60 |
| VISAs | | $ | - |
| Per Diem (Multiple Per Diem Rates) | | $ | 8,966.72 |

Per Person
Calculations:

| | |
|---|---|
| Salary Base: | **$57.15** |
| Deployment Premium: | 20% |
| Hazardous Premium: | 25% |

Overtime
Anticipated 4 hours per day Overtime
(Base x 1.5) x 4 hours x 27 days — $9,211.32
$85.29

Premiums
(Base x (DP + HP)) x (8 hrs + 4 OT hrs/day) x 27 days — $8,290.19
$11.37 (12 hrs)

Additional Insurance
(12 hr/day x 27 days x base) x 13.5% x 2 personnel — $4,974.11

| | | |
|---|---|---|
| SUB (per person) | $22,475.62 | |
| X # persons | 2 | |
| | $44,951.24 | $44,951.24 |

**Figure 18. Above and Beyond Sample (from MMCO, LCDR, Navy squadron VR-51, January 22, 2008)**

One recent change in concept to the way the Navy P-3 community has done business is Consolidated Maintenance Organization (CMO). As in the cost analysis contained in this thesis, it can be ascertained that the CMO is the wave of the future of the patrol and reconnaissance community. Although, there have been a few growing pains with the CMO concept, the direction the Navy will go in manning this particular maintenance concept with the replacement P-8A remains unclear.

Some distinct and varied conditions need to be studied before inception is mandated. As evidenced by the interviews conducted by the researchers, there are some benefits of using contractors for maintenance. Some have already been discussed in this thesis, but the researchers will now take a deeper look at a few subjects not covered.

After many interviews with P-3 squadron commanders (CO/XO, VP units, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008) and the Patrol squadron wing leadership (Chief of Staff, CDR, PATWING CPRW-2, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008) some interesting areas came up that need further research. All of the commanders interviewed had a vast experience level with both regular Navy and civilian contract personnel. The number one thing that kept coming up was "make sure the contract is well written and covers every aspect that could be needed." This statement warranted more questions and an interesting wide array of issues came out. The first question asked was "What problems do you see with using civilian contractors?" The number one thing that came up was compatibility issues with the normal Navy way of doing things and the loss of accountability with a contractor. The Officer in Charge (OIC) of the Hawaii CMO was concerned with contracts not having requirements for what if scenarios or what if a mishap happens or a crisis (OIC CDR Hunt & LCDR Watkins, CMO-2 Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008). All of the people that were interviewed by the researchers were worried about the deployment capability of the contractors, specifically getting the people there in a hurry. They all knew this could be done, but at what cost to the Navy.

During the interviews, certain questions continued to arise. Who is going to pay for all this? Are we really going to save by streamlining our commands utilizing civilian contractors? Here is a list of problems associated with contract costs that should be carefully researched and built into the initial contract:

— Costs associated with:

  - Per Diem
  - Rental cars
  - Overtime salary
  - Visas
  - Deployment premiums
  - Hazardous premiums
  - Insurance
  - Passports
  - Immunizations

—NJP capability

—Direct control by Commanders

—Oversight of civilians

—Training

  - Chemical, Biological and Radiological(CBR)
  - Weapons
  - Combat

The Navy commanders all stated that the benefits of using contract personnel were continuity and experience. The OIC and Maintenance Chief said that this was their first experience with contractor maintenance and they "have never seen things run so smooth" (POIC LCDR, MMCPO, Executive Transport Detachment, US Navy, Hawaii, January 23, 2008). They have had absolutely no problems and have been very pleased with the amount of enthusiasm and ability of their maintenance department. In their interviews, the QARs also stated the same thing about reliability and end product (QAR supervisors, 65th airlift squadron, 15th Airwing, Hickam AFB, Hawaii, January 23, 2008). The aircraft were always in top shape and they very rarely saw a repeat discrepancy. They felt the end product was as safe as possible. They stated that the contractors really had a sense of duty and loyalty to their country and squadron. They are proud of the work they performed and the accomplishments within the unit.

## C. OPERATIONAL IMPACTS OF A CLS MAINTENANCE MODEL

All of the potential savings achieved in a CLS maintenance organization are meaningless if the squadrons in question can not meet their operational obligations. Of the three models in question, contract CLS, organic personnel, or a hybrid CLS/organic combination, which is the best for the P-8A Poseidon from an operational perspective? First of all, defining what is best with objectivity complicates the analysis. It is easy to use dollars to compare options and to arrive at the most cost efficient result. Factors such as adaptability, readiness, and efficiency are more difficult to quantify and assign metrics, but it is possible. The intangible aspects of a squadron such as morale, esprit de corps, pride in ownership, even the safety climate of a squadron also contribute to operational success or failure.

Since no squadron has ever deployed into a combat situation with contract civilian support, there is no data from which to draw conclusions. For this portion of the analysis, expert opinions were collected. Experts were defined as personnel with extensive military experience to include operational and combat leadership. Several commanding officers and post-command officers were interviewed. Most requested anonymity, not for fear of retribution, but in attempts to remove any reputation biases from the analysis. All of the officers interviewed had at least 17 years of active service and all had interacted with civilian contractors in connection with their military duties at some point in their career. All had combat experience in Kosovo, Iraq and/or Afghanistan.

Other experts interviewed included officers working in non-combat squadrons with civilian maintenance personnel and some government employed civilians managing Air Force contracts with CLS maintenance. Although these individuals did not have specific maritime patrol and reconnaissance experience, they all had extensive operational experience in other areas of the military. There are parallels from their insights to the future P-8 platform.

### 1. The Consolidated Maintenance Organization

Before the operational impacts of a CLS maintenance component to a squadron are analyzed, recent changes to the P-3C community must be addressed. Recently all maintenance personnel have been removed from the squadrons and consolidated into one command, the Consolidated Maintenance Organization (CMO). At Kaneohe Bay, Hawaii, for example, one CMO supports three deployable squadrons. When an operational squadron deploys, personnel from the CMO augment the squadron for maintenance and logistic support. This is an attempt to reduce the number of personnel required to support the maintenance and logistics needs of the fleet and thus reduce costs. The P-8A logistics plan will be based on the existing CMO model. Also, all assumptions and research, including the manning cost analysis of this thesis, are based on the CMO model. However, this is a new concept and the first operational deployments of the P-3C from Hawaii under this concept are not yet complete. Measuring the maintenance impact on operational success is even more difficult since there is no historical reference.

How has the removal of squadron maintenance personnel to the CMO impacted operations? The expert opinions vary. The first squadron deploying from Hawaii to a combat zone with a CMO maintenance augment reported so far a 100 percent mission completion rate (Officer in Charge, CMO-2 Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008). They also deployed with 40 personnel less than the normal squadron contingent (Maintenance Officer, CMO-2 Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008). On the surface, the CMO concept does provide equal or better performance than before while utilizing fewer resources and, therefore, at a lower cost.

While the maritime community is meeting operational requirements using the CMO concept, the fact of its superiority over traditional maintenance is in dispute. Personnel chosen for the first deployment, in the opinion of one squadron commanding officer, were the top tier people available across three squadrons. “The lame, sick and lazy remained at home” (Commanding Officer of Patrol Squadron, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 23, 2008). First of all, when the three squadron maintenance departments joined into one command, no reduction in total personnel occurred. In essence, the CMO is currently overmanned with enlisted personnel, a fact confirmed by the CMO maintenance officer (Maintenance Officer, CMO-2 Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008). Second, training and preparations for the first deployment were conducted under the old squadron design. Because of the plethora of already qualified personnel, the CMO leadership did not have to choose below average performing personnel to deploy. Whether or not the CMO concept is successful cannot be determined with certainty until the oscillations from the organizational change reach equilibrium. Deployed mission completion rates will most probably not remain at 100 percent after manning levels are normalized.

Of further concern by several of the commanding officers interviewed was the efficiency of the CMO organization at home. There are currently fewer aircraft on the ramp to be shared by the two remaining squadrons at home and the CMO has 40 extra people (those who did not deploy) to maintain them. However, every commanding officer interviewed agreed that they have not seen an improvement in the quality of the material readiness of the aircraft (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008). “Pride in ownership” was the intangible reason given for the declining condition of the fleet. One commanding officer defended the CMO command, stating the amount of aircraft transfers over the last several years has led to the deterioration, not the CMO. A patrol squadron from Hawaii recently deployed with one aircraft that was its own from the inter-deployment training cycle (IDTC). The remaining aircraft were all transferred to them as they deployed. The commanding officer believes the level of pride in workmanship has not changed over the past several years (Commanding Officer of Patrol Squadron, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 23, 2008). Not surprisingly, the CMO leadership contends that the pride in their organization is greater than before. Now the maintenance team owns every aircraft on the ramp and the pride in ownership is wider than before (Officer in Charge, CMO-2 Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008).

Pride in ownership is not a trivial subject when talking about operational capability. Every commanding officer interviewed stressed its importance and the leadership challenges associated with a CMO augment. One commanding officer commented that there are no longer squadron aircraft painted with squadron colors on the tail. One officer said that aircraft washes are performed, but questioned how to increase the enthusiasm for such a mundane task (Commanding Officer of Patrol Squadron, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008).. The intangibles of squadron morale and esprit de corps can not be quantitatively measured, yet they impact the individual maintainer's contribution of just a little extra effort or just a few more minutes to remove some extra corrosion. The consensus from those interviewed was this does impact those quantifiable metrics like mission completion rates (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008).

Another commanding officer relayed more direct concerns of diametrically opposed missions and incentives of the CMO command and the operationally focused squadron. The CMO measures success in the amount of work completed or the amount of maintenance still to be performed (i.e. the number of outstanding maintenance actions on an aircraft where less is better). The squadron looks at readiness and missions completed as measures of success. By taking the maintenance department out of the squadron, the commanding officer no longer has the ability to make prioritization decisions between maintenance and operations. Each organization now has different agendas and. although they are supposed to be symbiotic, friction and compromise will occur to the detriment of efficiency (Commanding Officer of Patrol Squadron, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008).

While the two organizations do have different missions and agendas, this does present a large, but again intangible, benefit of the CMO organization. The operational squadron can now concentrate and focus efforts on its primary mission: the tactical employment of the maritime weapon system in an operational environment. Similarly, the CMO can focus on its mission: the scheduled and unscheduled maintenance of maritime patrol aircraft. Every commanding officer interviewed echoed the advantage of each independent organization improving in their respective expertise. However, two commanding officers did comment on the complimentary drawback. Now, the young junior officer in a squadron does not gain the maintenance knowledge to apply to the remainder of his career (Commanding Officers of Patrol Squadrons, Marine Corps Base

Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008). Similarly, the maintenance experts in the CMO will become further detached from the operational theories and applications in a squadron.

Another fallout from the new CMO command structure is the separation of the maintenance professionals and the aircrew that fly the aircraft. Several commanding officers stated safety concerns with the new concept. While the CMO does have some aircrew on board, they do not fly the aircraft on a daily basis. The interaction of the squadron aircrew to report mechanical failures, to explain the malfunctions, and to work with the maintenance technicians in their repair is critical to safety, readiness and, therefore, operational capability (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008).

The most serious question brought up by another commanding officer was concerning the ability of a CMO augmented squadron with a smaller number of personnel deployed to meet all of the detachment requirements in a complex environment. The commanding officer cited his most recent deployment without a CMO augment where his squadron was divided into five different locations. Three locations operated at two 12-hour shifts. The other two detachment sites operated one aircraft each and worked on an as needed basis. The commanding officer contends that the CMO concept would not have been able to support the operational requirement (Commanding Officer of Patrol Squadron, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008). In actuality, the limited number of personnel only limits the flexibility and response time of the deployed squadron. The CMO concept would have been able to support the requirement by sending more personnel on deployment. However, this negates some of the cost savings touted by CMO proponents and it would take some period of time to gather, train and deploy the necessary extra personnel.

From all of the interviews performed, there are obviously cultural roadblocks to such a large organizational change. It will take years before the cultural baggage of “that is how we used to do it” is removed. The experts interviewed spanned the spectrum from full support to complete disdain for the new concept (Commanding Officers of Patrol

Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008). This is the real leadership challenge to the success or failure of the CMO initiative.

The Consolidated Maintenance Organization might very well be more efficient and more capable than the traditional maintenance structure. There has not been enough time to reach a steady state with regards to command manning levels and the training and deploying of personnel. With the drawdown of the P-3C fleet, all of the issues described above will be addressed over time as leaders in the maritime community continue to meet operational requirements with fewer and fewer resources. In the meantime, there is not enough objective certainty to recommend whether or not this structure should be adopted by the P-8A acquisition team.

### 2. Operational Impacts of CLS Personnel in a P-8A Squadron

The change to the Consolidated Maintenance Organization by the patrol and reconnaissance community has been met with varied responses and uncertain success. The Integrated Product Team (IPT) for the P-8A could choose an even more radical model for the life cycle logistic and maintenance support: civilian contractors. An operational squadron has never deployed in combat with civilian maintenance. Of the three potential models, contract CLS, organic personnel, or a hybrid CLS/organic combination, which is the best for the P-8A Poseidon from an operational perspective?

Ironically, the same group of interviewed experts that could not reach a consensus regarding the success or failure of the CMO concept was unanimous in their support of civilian contractors. Each had interacted at some point in their careers with civilians across a wide range of fields in the Department of Defense and several had flown aircraft maintained by CLS personnel. Everyone interviewed had an overall positive experience and believed an operational CLS squadron was feasible. Implementation would be the challenge (Experts Marine Corps Base Hawaii (MCBH), Kaneohe Bay, and Hickam Air Force Bay, Honolulu, January 22 & 23, 2008).

The experts cited many potential operational risks to a CLS squadron, most of which were identical to the complaints listed about the CMO structure. Specific questions arose. Would there be enough personnel to support multiple operational deployment sites and requirements? Would there be enough flexibility to support expansion of contract requirements for combat situations? Would the commanding officer have authority over the civilian personnel while deployed? One commanding officer brought up a recent requirement to move a detachment from one site to another with only a few days notice, operate for about a week and finally return to the original operating base, all under combat situations. Would a commanding officer be restricted under a CLS contract in his ability to meet these operational requirements (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008)?

The experts were unanimous about the solution to these questions. Write the contract with enough specificity to ensure compliance to the worst case scenarios of combat operations. "Make sure it is in the contract" was echoed during every interview (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008). The Chief Staff Officer, who previously commanded a squadron with CLS maintenance, further added to include the proper incentives in the contract. Utilizing a PBL while rewarding the OEM-CLS will facilitate the required operational flexibility (Chief Staff Officer of Patrol Wing, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 23, 2008). Both of the recommendations are commonsensical, but will come at a great cost.

The most serious concern revolved around the possibility of extreme hazardous situations, such as combat. What if mortars were to become an everyday occurrence at a forward operating base? Would civilians be allowed to remain in such conditions? Would they be accountable to remain and perform their duties? The common solution was to ensure such contingencies, incentives and penalties were in the contract (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008).

Pride in ownership was a concern of the CMO concept brought up in repeated interviews. One former commanding officer was quick to point out past experiences with CLS maintenance in a test and evaluation squadron in Fallon, Nevada. "The aircraft were immaculate" (Former Commanding Officer of Patrol Squadron, Marine Corps Base

Hawaii (MCBH), Kaneohe Bay, February 5, 2008). Everyone interviewed had positive experiences with civilian support and echoed this former commanding officer's sentiments. Pride in ownership would not be a concern under a CLS contract. In fact, most lauded the potential benefits of civilians over organic personnel in this area (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008).

Another pro for CLS support was similar to one under the CMO concept. One commanding officer observed that a CLS maintenance team would allow P-8 officers to concentrate and focus on the combat operations and leave the maintenance concerns to the civilians (Commanding Officer of Patrol Squadron, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22, 2008). This is probably an oversimplification, but a well run contract would alleviate some pressures from the commanding officer and the other command leadership.

While a performance based complete CLS option was believed to be feasible from an operational perspective by all interviewed, the cost to implement the contract with enough operational reliability would be exorbitant and quite possibly cost prohibitive. Again, the experts were unanimous and supported a blended organic/CLS approach (Commanding Officers of Patrol Squadrons, Marine Corps Base Hawaii (MCBH), Kaneohe Bay, January 22 & 23, 2008). Organic Navy personnel could make up the brunt of the workload while OEM-CLS personnel could provide technical expertise to the squadron. This would maximize the advantages of both groups while potentially minimizing costs. The organic personnel would give flexibility to the commanding officer for hazardous detachments. Even the experts at Hickam Air Force Base managing the CLS program for the executive transport Boeing 737s agreed the hybrid approach was optimal, stating that the advantages of existing logistic lines from the OEM-CLS could still be harnessed (QAR supervisors, 65$^{th}$ Airlift Squadron, 15$^{th}$ Airwing, Hickam Air Force Base, Honolulu, Hawaii, January 23, 2008).

# V. CONCLUSIONS, RECOMMENDATIONS, AND AREAS FOR FURTHER RESEARCH

## A. CONCLUSIONS

### 1. OEM-CLS is the Cheapest Option from a Broad Perspective

Based on costing methods from the (1) Government Accountability Office, (2) NAVAIR 4.2, and (3) an independent manpower cost analysis conducted by this research, the OEM-CLS option is the most cost-efficient method of supplying maintenance for the lifecycle of the P-8A as identified in Figure 13. This conclusion is derived based upon the initiation and acceptance of a Congressional Legislative Proposal to obtain a single line of accounting for the OEM-CLS contract and is based on the fact that all military personnel identified for the CMO structure are in a sea duty billet and accounts for the cost of shore rotation personnel.

### 2. OEM-CLS Cost Savings are Difficult to Achieve

Cost savings that could be generated by an OEM-CLS structure cannot be realized under current Congressional funding procedures. The Director of the NAVAIR PBL Office stated that due to ten years of failures to convince Congress of a single line of accounting for CLS, NAVAIR would not take the lead on any new legislative proposal for single line of accounting initiatives for tip to tail coverage (Heron, 2007).

Even if the Congressional funding process could be modified, the tax benefit would not be realized as a cost savings as it is not part of any appropriation.

As 18.4 percent of the FAC-G billets are provided by the enlisted aviation community, it is unknown if a reduction of 789 to 845 personnel would cause a decrease in enlisted sailors required to fill these critical Navy billets.

Based on the data in Table 23, it is unlikely the Departments of Veterans' Affairs, Education, Defense and Navy would concede a 'salami slice' reduction in funding that can't be proportionately accredited to the reduction of 789 to 845 enlisted members.

### 3. A Thorough and Complete Contract is Needed to Ensure Contractor Accountability for All Operational Situations

Whatever the Navy's selection on the type of maintenance to use, the organic, CLS-OEM or a blended organic/CLS concept, it will have lasting effects on logistics, maintenance and acquisition during the P-8A life cycle. Whatever concept is selected, if it contains contractors in any fashion, the Navy and PMA-290 should ensure that every aspect of the type of maintenance and what will be required must be included in the contract. The contract must be thoroughly written and thought out. There should not be any gray areas to be deciphered or left for interpretation. The contract must state objectives in plain "black and white."

### 4. Most Advantageous

The organic/CLS blended option is the most advantageous for the P-8A from an operational perspective. This allows for the majority of the work force be made up of organic Navy personnel, while the technical expertise of the OEM-CLS provider can be harnessed. Additionally, this will give future commanding officers the flexibility to detach to hazardous areas.

## B. RECOMMENDATIONS

NAVAIR should select the organic/CLS blended option for the P-8A.

The organic/CLS blended option will result in the highest achievable cost savings based on Cost as an Independent Variable (CAIV) referenced in Figure 15. Operational and maintenance considerations further support this recommendation.

## C. AREAS FOR FURTHER RESEARCH

1. Analyze the current enlisted manning plan for the CMO. The manpower analysis showed a large percentage of cost related specifically to the need for a system of shore rotation. A study should be conducted to analyze if all 789 to 845 enlisted personnel need to be classified as "on sea duty". If a structure could be devised that offered an equitable distribution of work between sea and shore staffing, considerable cost savings could be realized.

2. Analyze the current effectiveness of the CMO organization in the P-3C community. Since the P-3 community changed over to a combined maintenance organization, there has not been an independent and objective analysis done to determine if the community is indeed better. No metrics are currently being recorded for this comparison by the Hawaii CMO. Operational impacts as well as maintenance and logistic costs or savings should be compared. The results have a direct impact to the future P-8 program.

3. Analyze and determine the real cost of the extra "above and beyond" costs to the Navy. Ensure these extra costs get included in the contracts. These additional costs, not usually included in the contracts, must be studied meticulously and determined rates must be included. The CLS contract must be well written or the true cost of the CLS will not be captured.

4. Analyze and determine the best value approach for training personnel under a blended organic/CLS organization. The life cycle training costs for the P-8 can not be accurately forecasted until the groundwork for the organizational relationships is laid. Is this something that should be mostly CLS provided or separated between the CLS and organic sub-organizations? Secondly, the training support materials could be separate from the training personnel required. Is there common off the shelf standard for support manuals and publications as they become more electronic vice a paper format? What are the impacts to the life cycle cost of the program?

5. Research further the life cycle logistics plan for the P-8. Similar to the discussion of maintenance support, the question of software support for the P-8 is not trivial and could conceivably lead to significant cost increases to the acquisition program. Should the software support be made of organic Navy personnel, should it be completely CLS, or is a hybrid solution feasible? Further research is warranted.

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